Learning Recovery
Grade 5 Summer Packet

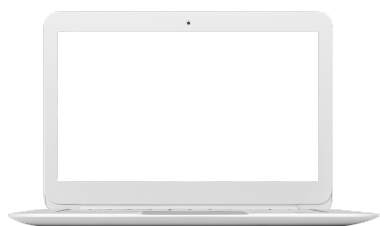## Grade 5 Mission 4   Lessons 1-30 (29 lessons*)
Multiply and Divide Fractions and Decimals

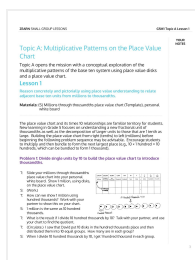## Grade 5 Mission 6   Lessons 1-15 (11 lessons*)
The Coordinate Plane

Students should complete one of the two sections below for each Mission:

Section One
Complete with all digital lessons

- Student Notes
- Exit Tickets

Section Two
If internet access is not available, complete paper-based work

- Problem Sets
- Homework

*Some lessons omitted from Zearn Math's Digital Lesson sequence - visit our Help Center to learn more

Mission 4: Multiply and Divide Fractions and Decimals

Section One: Student Notes and Exit Tickets
To complete with all digital lessons

Are you ready to ZEARN?

Multiply and Divide Fractions and Decimals

Name:_____

Lesson 1 G:5 M:4	Measure It, Plot It
	ZEARN STUDENT NOTES

Name:_____ Date:_____
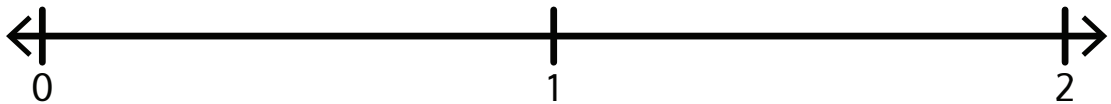
Complete: ☐   Class:_____

1 Jacob measured the height of 10 bean plants after their first week of sprouting and recorded the data in the table below.

Bean Plant Growth (in inches)

0   1   2

Bean plant	Height (in inches)
1	$\frac{3}{8}$
2	$\frac{1}{4}$
3	$1\frac{1}{8}$
4	$\frac{3}{8}$
5	$\frac{7}{8}$
6	$\frac{3}{8}$
7	$\frac{1}{4}$
8	$\frac{5}{8}$
9	1
10	$\frac{5}{8}$

2 **Which plant grew the most?**

_____ grew the most.

3 **Which plants grew the least?**

_____ grew the least.

4 **Which measurement was the most frequent?**

The most frequent measurement was _____ .

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1. Draw a line plot for the following data measured in inches:

   $1\frac{1}{2}$, $2\frac{3}{4}$, 3, $2\frac{3}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{3}{4}$, 3, $3\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$

2. Explain how you decided to divide your wholes into fractional parts, and how you decided where your number scale should begin and end.

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Draw a picture that shows the division expression. Then, write an equation and solve.

   a. $3 \div 9$

   b. $4 \div 3$

2. Fill in the blanks to make true number sentences.

a. $21 \div 8 =$ ———

b. $\dfrac{7}{4} =$ ——— $\div$ ———

c. $4 \div 9 =$ ———

d. $1\frac{2}{7} =$ ——— $\div$ ———
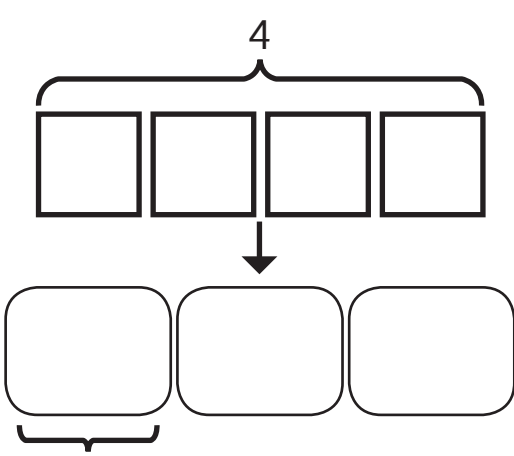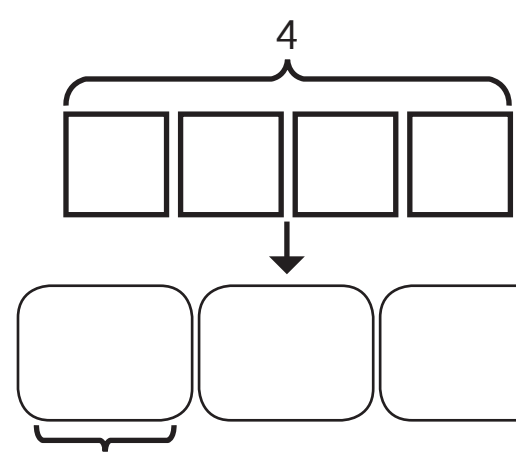
Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1 Jacob shares 4 sandwiches equally on 3 plates.

How many sandwiches will be on each plate?

ALGORITHM

Name:_____ Date:_____

Complete: ☐   Class:_____

1. A baker made 9 cupcakes, each a different type. Four people want to share them equally.

   How many cupcakes will each person get? Fill in the chart to show how to solve the problem.

Division Expression	Unit Forms	Fractions and Mixed Numbers	Standard Algorithm
Draw to show your thinking:			

Divide the Tape

ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1 Five tons of gravel is equally divided between 4 dump trucks.

How much gravel is in one dump truck?

5

?
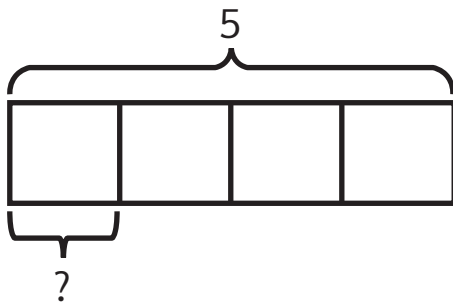
4 units = 5

1 unit = _____ ÷ _____

= _____

= _____

Each dump truck holds _____ tons of gravel.

Division Algorithm:

$4\overline{)5}$

Check:

4 × _____

= _____ + _____ + _____ + _____

= _____ + _____

= _____

Name:_____ Date:_____

Complete: ☐   Class:_____

1. Matthew and his 3 siblings are weeding a flower bed with an area of 9 square yards.

   If they share the job equally, how many square yards of the flower bed will each child need to weed? Use a tape diagram to show your thinking.

Lesson 5 **G:5 M:4**	**Draw Then Divide**
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:_____**

1 The Miller family likes to paddle along the North River.

They paddled the same distance each day throughout the course of 3 days, traveling a total of 14 miles.

How many miles did they travel each day?

DRAW

SOLVE

2 If the Millers went half their daily distance each day, but extended their trip to twice as many days, how far would they travel?

DRAW

SOLVE

EXTRA WORKSPACE

EXIT TICKET

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

A grasshopper covered a distance of 5 yards in 9 equal hops. How many yards did the grasshopper travel on each hop?

a. Draw a picture to support your work.

b. How many yards did the grasshopper travel after hopping twice?

Lesson 6 **G:5 M:4**	**Group Division**
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1 Kayla has 8 apples. She wants to give $\frac{3}{4}$ of the apples to her friends.

How many apples will her friends get?

Tape diagram:

Kayla's friends will get _____ apples.

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Find the value of each of the following:

   a. $\frac{1}{4}$ of 16 =

   b. $\frac{3}{4}$ of 16 =

2. Out of 18 cookies, $\frac{2}{3}$ are chocolate chip.

   How many of the cookies are chocolate chip?

Name:_____ Date:_____

Complete: ☐   Class:_____

Solve using a tape diagram.

1. $\frac{3}{5}$ of 30

2. $\frac{3}{5}$ of a number is 30. What's the number?

3. Mrs. Johnson baked 2 dozen cookies. Two-thirds of the cookies were oatmeal.

   How many oatmeal cookies did Mrs. Johnson bake?

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1

SHOW YOUR WORK

$$\frac{7}{6} \times 27 = \underline{\hspace{3cm}}$$

$$= \underline{\hspace{2cm}}$$

Name:_____ Date:_____

Complete: ☐　　　　　　　　　　　　　　　　　Class:_____

Solve each problem in two different ways as modeled in the example.

Example: $\frac{2}{3} \times 6 = \frac{2 \times 6}{3} = \frac{12}{3} = 4$　　　　　$\frac{2}{3} \times 6 = \frac{2 \times \cancel{6}\,^2}{\cancel{3}\,_1} = 4$

1. $\frac{2}{3} \times 15$　　　　　　　　　　　　　　$\frac{2}{3} \times 15$

2. $\frac{5}{4} \times 12$　　　　　　　　　　　　　　$\frac{5}{4} \times 12$

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Express 36 minutes as a fraction of an hour:

   36 minutes = _____ hour

2. Solve.

   a. $\dfrac{2}{3}$ feet = _____ inches

   b. $\dfrac{2}{5}$ m = _____ cm

   c. $\dfrac{5}{6}$ year = _____ months

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1

$$? $$

$$\frac{1}{3} - \frac{1}{4}$$

? = _____

= _____

= _____ × _____

= _____ × _____

= _____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Rewrite these expressions using words.

   a. $\frac{3}{4} \times (2 \frac{2}{5} - \frac{5}{6})$

   b. $2 \frac{1}{4} + \frac{8}{3}$

2. Write an expression, and then solve:

   Three less than one-fourth of the product of eight-thirds and nine.

SOLVE

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Use a tape diagram to solve.

   $\frac{2}{3}$ of 5

Lesson 12 G:5 M:4	Picture the Parts
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1 In Mr. Elliot's garden, $\frac{1}{8}$ of the flowers are red, $\frac{1}{4}$ of them are purple, and $\frac{1}{4}$ of the remaining flowers are pink.

If there are 128 flowers, how many flowers are pink?

DRAW

SOLVE

Name:_____ Date:_____

Complete: ☐ Class:_____

1. In a classroom, $\frac{1}{6}$ of the students are wearing blue shirts, and $\frac{2}{3}$ are wearing white shirts. There are 36 students in the class.

   How many students are wearing a shirt other than blue or white?

<table>
<tr><td>**Lesson 13**
G:5 M:4</td><td>**Fractions of Fractions**</td></tr>
<tr><td></td><td>**ZEARN STUDENT NOTES**</td></tr>
</table>

Name:_____ Date:_____

Complete: ☐   Class:_____

1 Jacob puts jam on $\frac{1}{3}$ slice of bread. He eats $\frac{1}{2}$ of the part with jam.

What fraction of the bread does Jacob eat?

SHOW YOUR WORK

1 whole
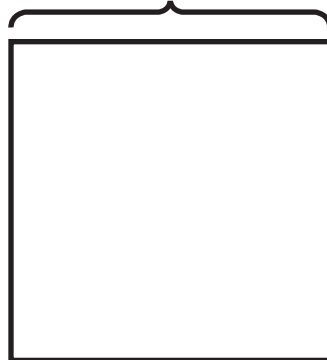
of

_____ _____

= _____ × _____

= _____

_____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Solve. Draw a rectangular fraction model, and write a number sentence to show your thinking.

$$\frac{1}{3} \times \frac{1}{3} =$$

2. Ms. Sheppard cuts $\frac{1}{2}$ of a piece of construction paper. She uses $\frac{1}{6}$ of the piece to make a flower.

   What fraction of the sheet of paper does she use to make the flower?

Lesson 14 **G:5 M:4**	**Fractions, Fractions ... FRACTIONS!**
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1 The gym teacher uses $\frac{3}{5}$ of his kickballs in class. Half of the remaining balls are given to students for recess.

What fraction of all the kickballs is given to students for recess?

SHOW YOUR WORK

Total kickballs

_____ = _____

_____

_____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a number sentence.

   $\dfrac{1}{3}$ of $\dfrac{3}{7}$ =

2. In a cookie jar, $\frac{1}{4}$ of the cookies are chocolate chip, and $\frac{1}{2}$ of the rest are peanut butter.

   What fraction of all the cookies is peanut butter?

Funky Fractions

ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1 Hannah completes $\frac{3}{7}$ of her homework immediately after school and $\frac{1}{4}$ of the remaining homework before supper. She finishes the rest after dessert.

What fraction of her work did she finish after dessert?

Total homework
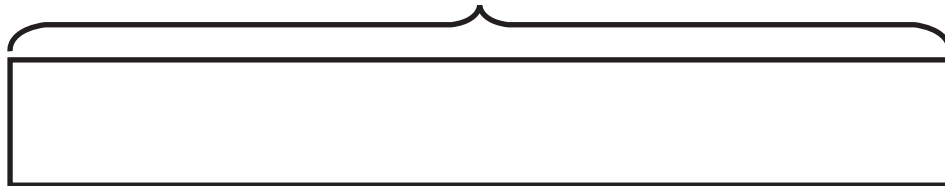
_____ of _____ = _____

_____ × _____ = _____

_____

_____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence.

    a. $\frac{2}{3}$ of $\frac{3}{5}$ =

    b. $\frac{4}{9} \times \frac{3}{8}$ =

2. A newspaper's cover page is $\frac{3}{8}$ text, and photographs fill the rest.

If $\frac{2}{5}$ of the text is an article about endangered species, what fraction of the cover page is the article about endangered species?

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Solve and show your thinking with a tape diagram.
   Three-quarters of the boats in the marina are white, $\frac{4}{7}$ of the remaining boats are blue, and the rest are red.

   If there are 9 red boats, how many boats are in the marina?

Name:_____ Date:_____

Complete: ☐   Class:_____

1

$$\frac{1}{10} \times 1.3$$

= _____ × _____

= _____

= _____
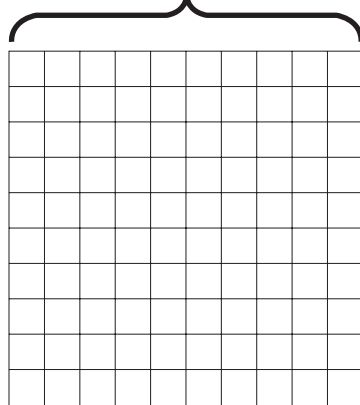
1 whole   1 whole
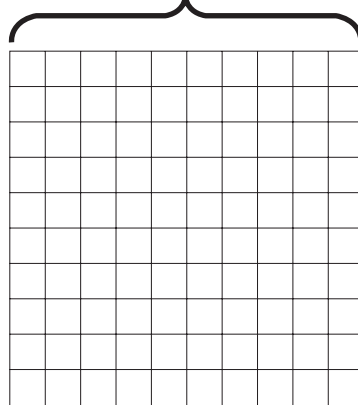
Name:_____ Date:_____

Complete: ☐   Class:_____

1. Multiply and model. Rewrite the expression as a number sentence with decimal factors.

   $\frac{1}{10} \times 1.2$
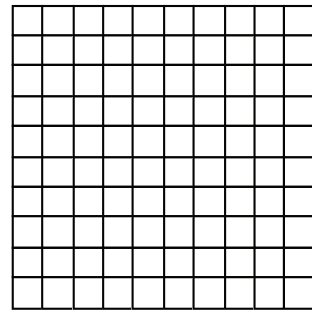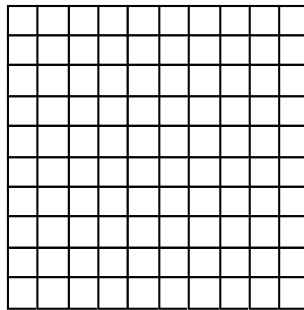
2. Multiply.

   a. $1.5 \times 3 =$ _____

   b. $1.5 \times 0.3 =$ _____

   c. $0.15 \times 0.3 =$ _____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Multiply. Do at least one problem using unit form and at least one problem using fraction form.

   a. 3.2 × 1.4 = _____

   b. 1.6 × 0.7 = _____

   c. 2.02 × 4.2 = _____

   d. 2.2 × 0.42 = _____

Name:_____ Date:_____

Complete: ☐　　　　　　　　　　　　　　　　Class:_____

1. Convert. Express your answer as a mixed number, if possible.

　a. 5 in = _____ ft

　b. 13 in = _____ ft

　c. 9 oz = _____ lb

　d. 18 oz = _____ lb

Lesson 20 **G:5 M:4**	**Conversions Return**
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1

1 yd = 3 ft

$4\frac{1}{3}$ yd = $4\frac{1}{3}$ × 1 yd

$4\frac{1}{3}$ yd

$= 4\frac{1}{3}$ × _____ ft

$=$ ——— × _____ ft
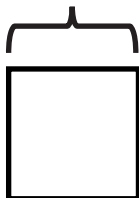
1 yd

$=$ ——————— ft

$=$ _____ ft

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Convert. Express your answer as a mixed number.

 a. $2\frac{1}{6}$ ft = _____ in

 b. $3\frac{3}{4}$ ft = _____ yd

 c. $2\frac{1}{2}$ c = _____ pt

 d. $3\frac{2}{3}$ years = _____ months

Name:_____ Date:_____

Complete: ☐   Class:_____

1

$$\frac{1}{4} \times \underline{\quad} = \underline{\quad} = \underline{\quad}$$

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Fill in the blanks to make the equation true.

$$\frac{9}{4} \times 1 = \frac{9}{4} \times \underline{\hspace{1.5cm}} = \frac{45}{20}$$

2. Express the fractions as equivalent decimals.

a. $\dfrac{3}{4}$ = _____

b. $\dfrac{2}{5}$ = _____

c. $\dfrac{3}{25}$ = _____

d. $\dfrac{5}{20}$ = _____

Name:_____ Date:_____

Complete: ☐   Class:_____

1. Fill in the blanks to make the number sentences true. Explain how you know.

   a. $\dfrac{}{3} \times 11 > 11$

   b. $5 \times \dfrac{}{8} < 5$

   c. $6 \times \dfrac{2}{} = 6$

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1. Fill in the blank using one of the following scaling factors to make each number sentence true.

1.009	1.00	0.898

   a. 3.06 × _____ < 3.06

   b. 5.2 × _____ = 5.2

   c. _____ × 0.89 > 0.89

2. Will the product of 22.65 × 0.999 be greater than or less than 22.65? Without calculating, explain how you know.

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1 There are $\frac{3}{4}$ as many cows as pigs on an animal farm.

If there are 35 pigs and cows on the farm, how many of them are pigs?

DRAW

SOLVE

2 A container holds 0.7 liters of oil and vinegar. $\frac{3}{4}$ of the mixture is vinegar.

How many liters of oil are in the container? Express your answer as both a fraction and a decimal.

DRAW

SOLVE

✓

Name:_____ Date:_____

Complete: ☐ Class:_____

1. An artist builds a sculpture out of metal and wood that weighs 14.9 kilograms. $\frac{3}{4}$ of this weight is metal, and the rest is wood.

   How much does the wood part of the sculpture weigh?

2. On a boat tour, there are half as many children as there are adults. There are 30 people on the tour.

   How many children are there?

Lesson 25 G:5 M:4	**Dividing Two Ways**
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1

$$5$$
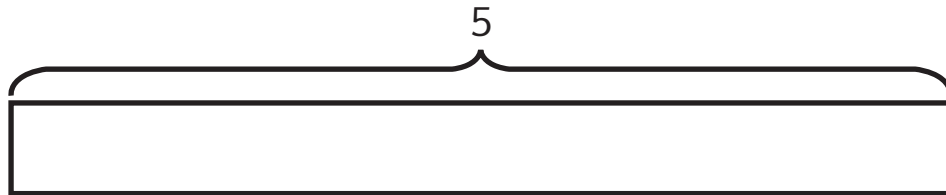
$$5 \div \frac{1}{3} = \underline{\hspace{1.5cm}}$$

There are _____ thirds in 1 whole.
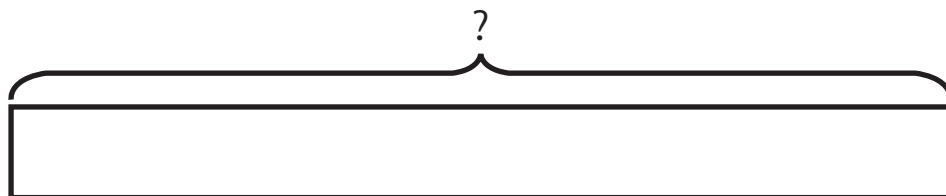
There are _____ thirds in 5 wholes.

$$?$$

$$5 \div \frac{1}{3} = \underline{\hspace{1.5cm}} \times \underline{\hspace{1.5cm}} = \underline{\hspace{1.5cm}}$$

If 5 is $\frac{1}{3}$, what is the whole? _____

Name:_____ Date:_____

Complete: ☐   Class:_____

1. Draw a tape diagram and a number line to solve. Fill in the blanks that follow.

   a. $5 \div \frac{1}{2} =$ _____   There are _____ halves in 1 whole.

   There are _____ halves in 5 wholes.

   5 is $\frac{1}{2}$ of what number? _____

   b. $4 \div \frac{1}{4} =$ _____   There are _____ fourths in 1 whole.

   There are _____ fourths in _____ wholes.

   4 is $\frac{1}{4}$ of what number? _____

2. Ms. Leverenz is doing an art project with her class. She has a 3 foot piece of ribbon.

If she gives each student an eighth of a foot of ribbon, will she have enough for her class of 22 students?

Divide the Part

ZEARN STUDENT NOTES

Name:_____ Date:_____

Complete: ☐   Class:_____

1 Jacob gives some bread to his 3 friends to share equally.

If he has $\frac{1}{2}$ loaf of bread, what fraction of a whole loaf will each friend receive?

1

_____ ÷ _____ = _____

_____ ÷ _____ = _____
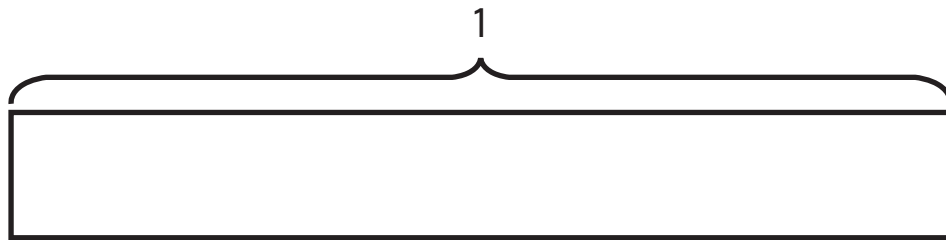
Each friend will receive _____ loaf of bread.

2 Hannah gives some bread to her 3 friends to share equally.

If she has $\frac{1}{3}$ loaf of bread, what fraction of a whole loaf will each friend receive?

1

_____ ÷ _____ = _____

_____ ÷ _____ = _____
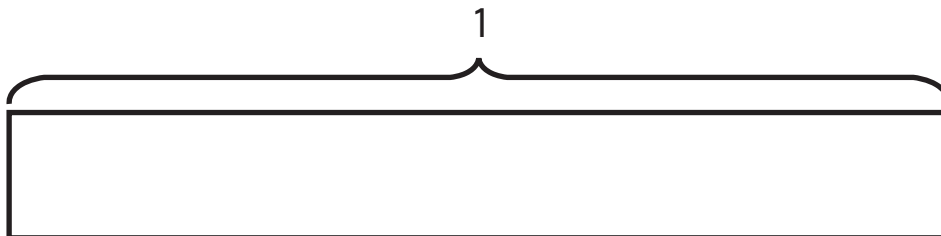
Each friend will receive _____ loaf of bread.

EXTRA WORKSPACE

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. Solve. Support at least one of your answers with a model or tape diagram.

    a. $\frac{1}{2} \div 4 =$ _____

    b. $\frac{1}{8} \div 5 =$ _____

2. Larry spends half of his workday teaching piano lessons.

    If he sees 6 students, each for the same amount of time, what fraction of his workday is spent with each student?

Partition Power

ZEARN STUDENT NOTES

Name:_____ Date:_____

Complete: ☐ Class:_____

1 Mr. Brown has $\frac{1}{4}$ pan of lasagna left in the refrigerator. He wants to cut the lasagna into equal slices so he can have it for dinner for 3 nights.

What fraction of the whole lasagna will he eat each night?

DRAW

SOLVE

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Kevin divides 3 pieces of paper into fourths.

   How many fourths does he have? Draw a picture to support your response.

2. Sybil has $\frac{1}{2}$ of a pizza left over. She wants to share the pizza with 3 of her friends.

   What fraction of the original pizza will Sybil and her 3 friends each receive? Draw a picture to support your response.

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1. 8.3 is equal to _____ tenths

   _____ hundredths

2. 28 is equal to _____ hundredths

   _____ tenths

3. $15.09 \div 0.01 =$ _____

4. $267.4 \div \frac{1}{10} =$ _____

5. $632.98 \div \frac{1}{100} =$ _____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

1

$1.6 \div 0.04 =$ ———

$= $ ——— $\times$ ———

$= $ ———

$= $ ———

2

$1.68 \div 0.04 =$ ———

$= $ ——— $\times$ ———

$= $ ———

$= $ ———

EXTRA WORKSPACE

Name:_____ Date:_____

Complete: ☐

Class:_____

1. Rewrite the division expression as a fraction and divide.

   a. 3.2 ÷ 0.8 = _____

   b. 3.2 ÷ 0.08 = _____

   c. 7.2 ÷ 0.9 = _____

   d. 0.72 ÷ 0.09 = _____

ZEARN
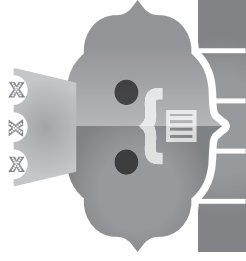
Congratulations!
You completed

Grade 5 Mission 4

Multiply and Divide Fractions and Decimals

Zearned it!

Name

Date

Mission 4: Multiply and Divide Fractions and Decimals

Section Two: Problem Sets and Homework
To complete if internet access is not available

Name _____   Date _____

1. Estimate the length of your pencil to the nearest inch. _____

2. Using a ruler, measure your pencil strip to the nearest $\frac{1}{2}$ inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.
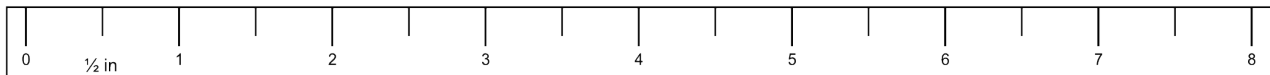
3. Using a ruler, measure your pencil strip to the nearest $\frac{1}{4}$ inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.
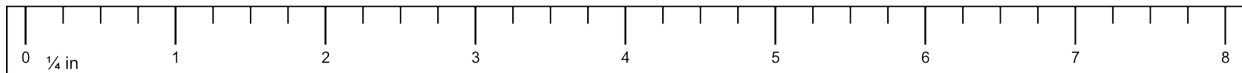
4. Using a ruler, measure your pencil strip to the nearest $\frac{1}{8}$ inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.

EUREKA MATH™

Lesson 1: Measure and compare pencil lengths to the nearest $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ of an inch, and analyze the data through line plots.

engage^ny

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

5. Use all three of your line plots to complete the following:

   a. Compare the three plots, and write one sentence that describes how the plots are alike and one sentence that describes how they are different.

   b. What is the difference between the measurements of the longest and shortest pencils on each of the three line plots?

   c. Write a sentence describing how you could create a more precise ruler to measure your pencil strip.

engage^{ny}

Name _____   Date _____

1. Draw a picture to show the division. Write a division expression using unit form. Then, express your answer as a fraction. The first one is partially done for you.

    a. $1 \div 5 = 5$ fifths $\div 5 = 1$ fifth $= \frac{1}{5}$

    b. $3 \div 4$

    c. $6 \div 4$

Lesson 2:   Interpret a fraction as division.

engage^{ny}

2. Draw to show how 2 children can equally share 3 cookies. Write an equation, and express your answer as a fraction.

3. Carly and Gina read the following problem in their math class:

   Seven cereal bars were shared equally by 3 children. How much did each child receive?

   Carly and Gina solve the problem differently. Carly gives each child 2 whole cereal bars and then divides the remaining cereal bar among the 3 children. Gina divides all the cereal bars into thirds and shares the thirds equally among the 3 children.

   a. Illustrate both girls' solutions.

   b. Explain why they are both right.

4. Fill in the blanks to make true number sentences.

   a. $2 \div 3 = \overline{}$

   b. $15 \div 8 = \overline{}$

   c. $11 \div 4 = \overline{}$

   d. $\dfrac{3}{2} =$ _____ ÷ _____

   e. $\dfrac{9}{13} =$ _____ ÷ _____

   f. $1\dfrac{1}{3} =$ _____ ÷ _____

Name _____   Date _____

1. Fill in the chart. The first one is done for you.

Division Expression	Unit Forms	Improper Fraction	Mixed Numbers	Standard Algorithm (Write your answer in whole numbers and fractional units. Then check.)
a. $5 \div 4$	20 fourths ÷ 4 = 5 fourths	$\frac{5}{4}$	$1\frac{1}{4}$	$4\overline{\smash{)}5} \quad 1\frac{1}{4}$, -4 , 1 Check $4 \times 1\frac{1}{4} = 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4}$ $= 4 + \frac{4}{4}$ $= 4 + 1$ $= 5$
b. $3 \div 2$	___ halves ÷ 2 = ___ halves		$1\frac{1}{2}$	
c. ___ ÷ ___	24 fourths ÷ 4 = 6 fourths			$4\overline{\smash{)}6}$
d. $5 \div 2$		$\frac{5}{2}$	$2\frac{1}{2}$	

EUREKA MATH™

Lesson 3:   Interpret a fraction as division.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original
(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

2. A principal evenly distributes 6 reams of copy paper to 8 fifth-grade teachers.

   a. How many reams of paper does each fifth-grade teacher receive? Explain how you know using pictures, words, or numbers.

   b. If there were twice as many reams of paper and half as many teachers, how would the amount each teacher receives change? Explain how you know using pictures, words, or numbers.

3. A caterer has prepared 16 trays of hot food for an event. The trays are placed in warming boxes for delivery. Each box can hold 5 trays of food.

   a. How many warming boxes are necessary for delivery if the caterer wants to use as few boxes as possible? Explain how you know.

   b. If the caterer fills a box completely before filling the next box, what fraction of the last box will be empty?

EUREKA MATH™

Lesson 3: Interpret a fraction as division.

engage^{ny}

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____   Date _____

1. Draw a tape diagram to solve. Express your answer as a fraction. Show the multiplication sentence to check your answer. The first one is done for you.

   a. $1 \div 3 = \frac{1}{3}$

   Check: $3 \times \frac{1}{3}$

   1

   3 units = 1

   1 unit = 1 ÷ 3

   $= \frac{1}{3}$

   ?

   $3 \overline{\smash{\big)}\, 1}$ 0 $\frac{1}{3}$

   $- 0$

   1

   $= \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$

   $= \frac{3}{3}$

   $= 1$

   b. $2 \div 3 = \underline{\quad}$

   c. $7 \div 5 = \underline{\quad}$

   d. $14 \div 5 = \underline{\quad}$

2. Fill in the chart. The first one is done for you.

Division Expression	Fraction	Between which two whole numbers is your answer?	Standard Algorithm
a. 13 ÷ 3	$\dfrac{13}{3}$	4 and 5	$4\frac{1}{3}$ $3\overline{)\,13}$ $\underline{-12}$ 1
b. 6 ÷ 7		0 and 1	$7\overline{)\,6}$
c. ____ ÷ ____	$\dfrac{55}{10}$		
d. ___ ÷ ___	$\dfrac{32}{40}$		$40\overline{)\,32}$

EUREKA MATH

Lesson 4:   Use tape diagrams to model fractions as division.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original
(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

3. Greg spent $4 on 5 packs of sport cards.

    a. How much did Greg spend on each pack?

    b. If Greg spent half as much money and bought twice as many packs of cards, how much did he spend on each pack? Explain your thinking.

4. Five pounds of birdseed is used to fill 4 identical bird feeders.

    a. What fraction of the birdseed will be needed to fill each feeder?

    b. How many pounds of birdseed are used to fill each feeder? Draw a tape diagram to show your thinking.

    c. How many ounces of birdseed are used to fill three bird feeders?

Name _____   Date _____

1. A total of 2 yards of fabric is used to make 5 identical pillows. How much fabric is used for each pillow?

2. An ice cream shop uses 4 pints of ice cream to make 6 sundaes. How many pints of ice cream are used for each sundae?

3. An ice cream shop uses 6 bananas to make 4 identical sundaes. How many bananas are used in each sundae? Use a tape diagram to show your work.

4. Julian has to read 4 articles for school. He has 8 nights to read them. He decides to read the same number of articles each night.

    a. How many articles will he have to read per night?

    b. What fraction of the reading assignment will he read each night?

5. 40 students shared 5 pizzas equally. How much pizza will each student receive? What fraction of the pizza did each student receive?

6. Lillian had 2 two-liter bottles of soda, which she distributed equally between 10 glasses.

    a. How much soda was in each glass? Express your answer as a fraction of a liter.

EUREKA MATH

Lesson 5:   Solve word problems involving the division of whole numbers with answers in the form of fractions or whole numbers.

engage^ny

b. Express your answer as a decimal number of liters.

c. Express your answer as a whole number of milliliters.

7. The Calef family likes to paddle along the Susquehanna River.

a. They paddled the same distance each day over the course of 3 days, traveling a total of 14 miles. How many miles did they travel each day? Show your thinking in a tape diagram.

b. If the Calefs went half their daily distance each day but extended their trip to twice as many days, how far would they travel?

Lesson 5: Solve word problems involving the division of whole numbers with answers in the form of fractions or whole numbers.

engage^{ny}

Modified from original

Name _____   Date _____

1. Find the value of each of the following.

a.

$\frac{1}{3}$ of 9 =

$\frac{2}{3}$ of 9 =

$\frac{3}{3}$ of 9 =

b.

$\frac{1}{3}$ of 15 =

$\frac{2}{3}$ of 15 =

$\frac{3}{3}$ of 15 =

c.

$\frac{1}{5}$ of 20 =

$\frac{4}{5}$ of 20 =

$\frac{}{5}$ of 20 = 20

d.

$\frac{1}{8}$ of 24 =

$\frac{3}{8}$ of 24 =

$\frac{4}{8}$ of 24 =

$\frac{6}{8}$ of 24 =

$\frac{7}{8}$ of 24 =

EUREKA MATH™

Lesson 6:   Relate fractions as division to fraction of a set.

engage^{ny}
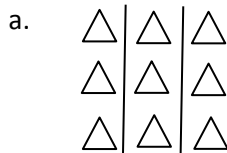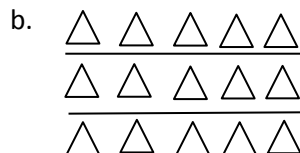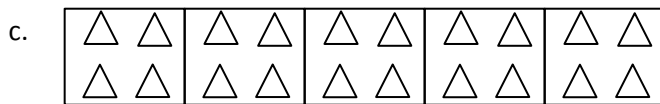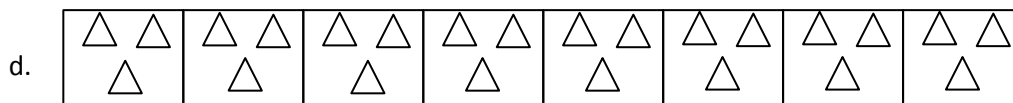
2. Find $\frac{4}{7}$ of 14. Draw a set, and shade to show your thinking.

3. How does knowing $\frac{1}{8}$ of 24 help you find three-eighths of 24? Draw a picture to explain your thinking.

4. There are 32 students in a class. Of the class, $\frac{3}{8}$ of the students bring their own lunches. How many students bring their lunches?

5. Jack collected 18 ten-dollar bills while selling tickets for a show. He gave $\frac{1}{6}$ of the bills to the theater and kept the rest. How much money did he keep?

EUREKA MATH™

Lesson 6:   Relate fractions as division to fraction of a set.

engage^{ny}

Modified from original

Name _____   Date _____

1. Solve using a tape diagram.

   a. $\frac{1}{3}$ of 18

   b. $\frac{1}{3}$ of 36

   c. $\frac{3}{4} \times 24$

   d. $\frac{3}{8} \times 24$

   e. $\frac{4}{5} \times 25$

   f. $\frac{1}{7} \times 140$

   g. $\frac{1}{4} \times 9$

   h. $\frac{2}{5} \times 12$

   i. $\frac{2}{3}$ of a number is 10. What's the number?

   j. $\frac{3}{4}$ of a number is 24. What's the number?

EUREKA MATH™

Lesson 7:   Multiply any whole number by a fraction using tape diagrams.

engage^{ny}

2. Solve using tape diagrams.

   a. There are 48 students going on a field trip. One-fourth are girls. How many boys are going on the trip?

   b. Three angles are labeled below with arcs. The smallest angle is $\frac{3}{8}$ as large as the 160° angle. Find the value of angle a.
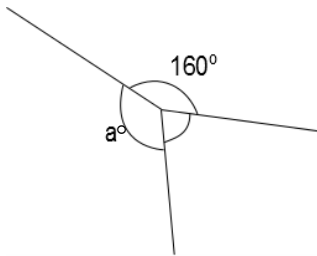
   c. Abbie spent $\frac{5}{8}$ of her money and saved the rest. If she spent $45, how much money did she have at first?

   d. Mrs. Harrison used 16 ounces of dark chocolate while baking. She used $\frac{2}{5}$ of the chocolate to make some frosting and used the rest to make brownies. How much more chocolate did Mrs. Harrison use in the brownies than in the frosting?

EUREKA MATH

Lesson 7: Multiply any whole number by a fraction using tape diagrams.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____   Date _____

1. Laura and Sean find the product of $\frac{2}{3} \times 4$ using different methods.

    Laura: It's 2 thirds of 4.   *Sean:* It's 4 groups of 2 thirds.

    $\frac{2}{3} \times 4 = \frac{4}{3} + \frac{4}{3} = 2 \times \frac{4}{3} = \frac{8}{3}$ $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = 4 \times \frac{2}{3} = \frac{8}{3}$

    Use words, pictures, or numbers to compare their methods in the space below.

2. Rewrite the following addition expressions as fractions as shown in the example.

    Example: $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{4 \times 2}{3} = \frac{8}{3}$

    a. $\frac{7}{4} + \frac{7}{4} + \frac{7}{4} =$ b. $\frac{14}{5} + \frac{14}{5} =$ c. $\frac{4}{7} + \frac{4}{7} + \frac{4}{7} =$

3. Solve and model each problem as a fraction of a set and as repeated addition.
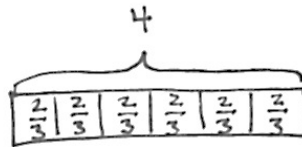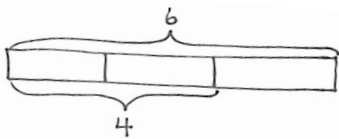
    Example: $\frac{2}{3} \times 6 = 2 \times \frac{6}{3} = 2 \times 2 = 4$ $6 \times \frac{2}{3} = \frac{6 \times 2}{3} = 4$

    a. $\frac{1}{2} \times 8$ $8 \times \frac{1}{2}$

    b. $\frac{3}{5} \times 10$ $10 \times \frac{3}{5}$

EUREKA MATH™

Lesson 8:   Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original
(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

4. Solve each problem in two different ways as modeled in the example.

   Example: $6 \times \frac{2}{3} = \frac{6 \times 2}{3} = \frac{3 \times 2 \times 2}{3} = \frac{3 \times 4}{3} = 4$ $6 \times \frac{2}{3} = \frac{\overset{2}{\cancel{6}} \times 2}{\underset{1}{\cancel{3}}} = 4$

   a. $14 \times \frac{3}{7}$ $14 \times \frac{3}{7}$

   b. $\frac{3}{4} \times 36$ $\frac{3}{4} \times 36$

   c. $30 \times \frac{13}{10}$ $30 \times \frac{13}{10}$

   d. $\frac{9}{8} \times 32$ $\frac{9}{8} \times 32$

5. Solve each problem any way you choose.

   a. $\frac{1}{2} \times 60$ $\frac{1}{2}$ minute = _____ seconds

   b. $\frac{3}{4} \times 60$ $\frac{3}{4}$ hour = _____ minutes
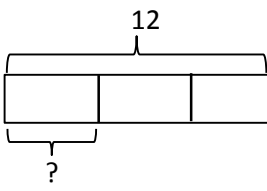
   c. $\frac{3}{10} \times 1{,}000$ $\frac{3}{10}$ kilogram = _____ grams

   d. $\frac{4}{5} \times 100$ $\frac{4}{5}$ meter = _____ centimeters

---

EUREKA MATH™ | **Lesson 8:**   Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.   **engage**^ny

Modified from original

Name _____ Date _____

1. Convert. Show your work using a tape diagram or an equation. The first one is done for you.

a. $\frac{1}{2}$ yard = ____$1\frac{1}{2}$____ feet

$\frac{1}{2}$ yard = $\frac{1}{2}$ × 1 yard

$\quad$ = $\frac{1}{2}$ × 3 feet

$\quad$ = $\frac{3}{2}$ feet

$\quad$ = $1\frac{1}{2}$ feet

b. $\frac{1}{3}$ foot = _____ inches

$\frac{1}{3}$ foot = $\frac{1}{3}$ × 1 foot

$\quad$ = $\frac{1}{3}$ × 12 inches

$\quad$ =

c. $\frac{5}{6}$ year = _____ months

d. $\frac{4}{5}$ meter = _____ centimeters

e. $\frac{2}{3}$ hour = _____ minutes

f. $\frac{3}{4}$ yard = _____ inches

EUREKA MATH™

Lesson 9: Find a fraction of a measurement, and solve word problems.

engage^{ny}

2. Mrs. Lang told her class that the class's pet hamster is $\frac{1}{4}$ ft in length. How long is the hamster in inches?

3. At the market, Mr. Paul bought $\frac{7}{8}$ lb of cashews and $\frac{3}{4}$ lb of walnuts.

   a. How many ounces of cashews did Mr. Paul buy?

   b. How many ounces of walnuts did Mr. Paul buy?

   c. How many more ounces of cashews than walnuts did Mr. Paul buy?

   d. If Mrs. Toombs bought $1\frac{1}{2}$ pounds of pistachios, who bought more nuts, Mr. Paul or Mrs. Toombs? How many ounces more?

4. A jewelry maker purchased 20 inches of gold chain. She used $\frac{3}{8}$ of the chain for a bracelet. How many inches of gold chain did she have left?

EUREKA MATH

Lesson 9:   Find a fraction of a measurement, and solve word problems.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

(cc) BY-NC-SA   This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

1. Write expressions to match the diagrams. Then, evaluate.
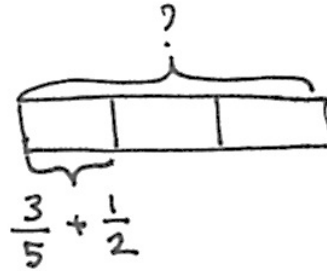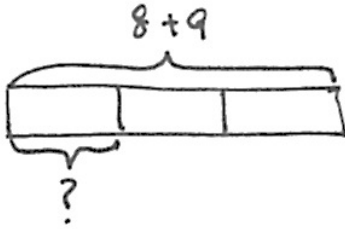
2. Write an expression to match, and then evaluate.

a. $\frac{1}{6}$ the sum of 16 and 20

b. Subtract 5 from $\frac{1}{3}$ of 23.

c. 3 times as much as the sum of $\frac{3}{4}$ and $\frac{2}{6}$

d. $\frac{2}{5}$ of the product of $\frac{5}{6}$ and 42

e. 8 copies of the sum of 4 thirds and 2 more

f. 4 times as much as 1 third of 8

EUREKA MATH™

| Lesson 10: | Compare and evaluate expressions with parentheses.

engage^{ny}

3. Circle the expression(s) that give the same product as $\frac{4}{5} \times 7$. Explain how you know.

$4 \div (7 \times 5)$ $7 \div 5 \times 4$ $(4 \times 7) \div 5$ $4 \div (5 \times 7)$ $4 \times \frac{7}{5}$ $7 \times \frac{4}{5}$

4. Use <, >, or = to make true number sentences without calculating. Explain your thinking.
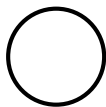
a. $4 \times 2 + 4 \times \frac{2}{3}$ $\bigcirc$ $3 \times \frac{2}{3}$

b. $\left(5 \times \frac{3}{4}\right) \times \frac{2}{5}$ $\bigcirc$ $\left(5 \times \frac{3}{4}\right) \times \frac{2}{7}$

c. $3 \times \left(3 + \frac{15}{12}\right)$ $\bigcirc$ $(3 \times 3) + \frac{15}{12}$

EUREKA MATH™

Lesson 10:   Compare and evaluate expressions with parentheses.

engage^{ny}
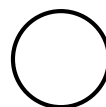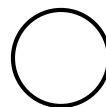
5. Collette bought milk for herself each month and recorded the amount in the table below. For (a)–(c), write an expression that records the calculation described. Then, solve to find the missing data in the table.

a. She bought $\frac{1}{4}$ of July's total in June.

b. She bought $\frac{3}{4}$ as much in September as she did in January and July combined.

c. In April, she bought $\frac{1}{2}$ gallon less than twice as much as she bought in August.

Month	Amount (in gallons)
January	3
February	2
March	$1\frac{1}{4}$
April	
May	$\frac{7}{4}$
June	
July	2
August	1
September	
October	$\frac{1}{4}$

d. Display the data from the table in a line plot.

e. How many gallons of milk did Collette buy from January to October?

Name _____   Date _____

1. Kim and Courtney share a 16-ounce box of cereal. By the end of the week, Kim has eaten $\frac{3}{8}$ of the box, and Courtney has eaten $\frac{1}{4}$ of the box of cereal. What fraction of the box is left?

2. Mathilde has 20 pints of green paint. She uses $\frac{2}{5}$ of it to paint a landscape and $\frac{3}{10}$ of it while painting a clover. She decides that, for her next painting, she will need 14 pints of green paint. How much more paint will she need to buy?

EUREKA MATH

Lesson 11: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^{ny}

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

3. Jack, Jill, and Bill each carried a 48-ounce bucket full of water down the hill. By the time they reached the bottom, Jack's bucket was only $\frac{3}{4}$ full, Jill's was $\frac{2}{3}$ full, and Bill's was $\frac{1}{6}$ full. How much water did they spill altogether on their way down the hill?

4. Mrs. Diaz makes 5 dozen cookies for her class. One-ninth of her 27 students are absent the day she brings the cookies. If she shares the cookies equally among the students who are present, how many cookies will each student get?

5. Create a story problem about a fish tank for the tape diagram below. Your story must include a fraction.

84

?

EUREKA MATH

Lesson 11: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015
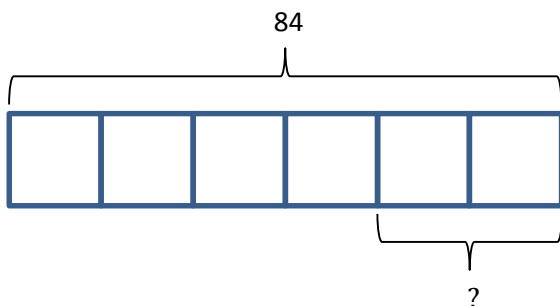
Name _____   Date _____

1. A baseball team played 32 games and lost 8. Katy was the catcher in $\frac{5}{8}$ of the winning games and $\frac{1}{4}$ of the losing games.

    a. What fraction of the games did the team win?

    b. In how many games did Katy play catcher?

2. In Mrs. Elliott's garden, $\frac{1}{8}$ of the flowers are red, $\frac{1}{4}$ of them are purple, and $\frac{1}{5}$ of the remaining flowers are pink. If there are 128 flowers, how many flowers are pink?

EUREKA MATH

Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^ny

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

3. Lillian and Darlene plan to get their homework finished within one hour. Darlene completes her math homework in $\frac{3}{5}$ hour. Lillian completes her math homework with $\frac{5}{6}$ hour remaining. Who completes her homework faster, and by how many minutes?

   Bonus: Give the answer as a fraction of an hour.

4. Create and solve a story problem about a baker and some flour whose solution is given by the expression $\frac{1}{4} \times (3 + 5)$.

EUREKA MATH™

Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^{ny}

5. Create and solve a story problem about a baker and 36 kilograms of an ingredient that is modeled by the following tape diagram. Include at least one fraction in your story.
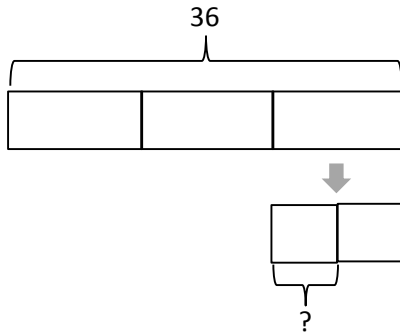
6. Of the students in Mr. Smith's fifth-grade class, $\frac{1}{3}$ were absent on Monday. Of the students in Mrs. Jacobs' class, $\frac{2}{5}$ were absent on Monday. If there were 4 students absent in each class on Monday, how many students are in each class?

Name _____   Date _____

1. Solve. Draw a rectangular fraction model to show your thinking. Then, write a multiplication sentence.
    The first one has been done for you.

    a. Half of $\frac{1}{4}$ pan of brownies = ____$\frac{1}{8}$____ pan of brownies.

    $$\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$
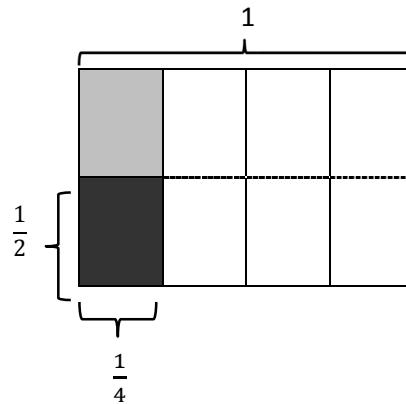
    b. Half of $\frac{1}{3}$ pan of brownies = _____ pan of
        brownies.

    c. A fourth of $\frac{1}{3}$ pan of brownies = _____ pan of
        brownies.

    d. $\frac{1}{4}$ of $\frac{1}{4}$

    e. $\frac{1}{2}$ of $\frac{1}{6}$

EUREKA MATH™

Lesson 13:   Multiply unit fractions by unit fractions.

engage^{ny}

2. Draw rectangular fraction models of $3 \times \frac{1}{4}$ and $\frac{1}{3} \times \frac{1}{4}$. Compare multiplying a number by 3 and by 1 third.

3. $\frac{1}{2}$ of Ila's workspace is covered in paper. $\frac{1}{3}$ of the paper is covered in yellow sticky notes. What fraction of Ila's workspace is covered in yellow sticky notes? Draw a picture to support your answer.

4. A marching band is rehearsing in rectangular formation. $\frac{1}{5}$ of the marching band members play percussion instruments. $\frac{1}{2}$ of the percussionists play the snare drum. What fraction of all the band members play the snare drum?

5. Marie is designing a bedspread for her grandson's new bedroom. $\frac{2}{3}$ of the bedspread is covered in race cars, and the rest is striped. $\frac{1}{4}$ of the stripes are red. What fraction of the bedspread is covered in red stripes?

Name _____   Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a number sentence. An example has been done for you.

Example:

$\frac{1}{2}$ of $\frac{2}{5}$ = $\frac{1}{2}$ of 2 fifths = 1 fifth(s)
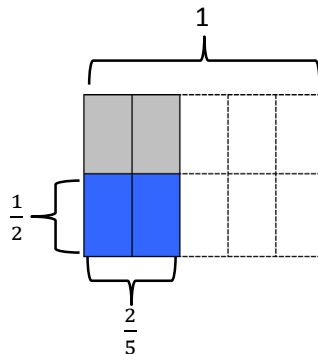
$$\frac{1}{2} \times \frac{2}{5} = \frac{2}{10} = \frac{1}{5}$$

a. $\frac{1}{3}$ of $\frac{3}{4}$ = $\frac{1}{3}$ of _____ fourth(s) = _____ fourth(s)

b. $\frac{1}{2}$ of $\frac{4}{5}$ = $\frac{1}{2}$ of _____ fifth(s) = _____ fifth(s)

c. $\frac{1}{2}$ of $\frac{2}{2}$ =

d. $\frac{2}{3}$ of $\frac{1}{2}$ =

e. $\frac{1}{2} \times \frac{3}{5}$ =

f. $\frac{2}{3} \times \frac{1}{4}$ =

EUREKA MATH™

Lesson 14: Multiply unit fractions by non-unit fractions.

engage^{ny}

2. $\frac{5}{8}$ of the songs on Harrison's music player are hip-hop. $\frac{1}{3}$ of the remaining songs are rhythm and blues. What fraction of all the songs are rhythm and blues? Use a tape diagram to solve.

3. Three-fifths of the students in a room are girls. One-third of the girls have blond hair. One-half of the boys have brown hair.

    a. What fraction of all the students are girls with blond hair?

    b. What fraction of all the students are boys without brown hair?

4. Cody and Sam mowed the yard on Saturday. Dad told Cody to mow $\frac{1}{4}$ of the yard. He told Sam to mow $\frac{1}{3}$ of the remainder of the yard. Dad paid each of the boys an equal amount. Sam said, "Dad, that's not fair! I had to mow one-third, and Cody only mowed one-fourth!" Explain to Sam the error in his thinking. Draw a picture to support your reasoning.

Name _____   Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence. The first one is done for you.

   a. $\frac{2}{3}$ of $\frac{3}{5}$

      $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$
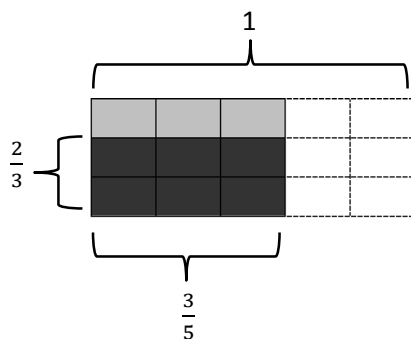
   b. $\frac{3}{4}$ of $\frac{4}{5} =$ c. $\frac{2}{5}$ of $\frac{2}{3} =$

   d. $\frac{4}{5} \times \frac{2}{3} =$ e. $\frac{3}{4} \times \frac{2}{3} =$

2. Multiply. Draw a rectangular fraction model if it helps you, or use the method in the example.

   Example: $\frac{6}{7} \times \frac{5}{8} = \frac{\overset{3}{\cancel{6}} \times 5}{7 \times \underset{4}{\cancel{8}}} = \frac{15}{28}$

   a. $\frac{3}{4} \times \frac{5}{6}$ b. $\frac{4}{5} \times \frac{5}{8}$

EUREKA MATH

Lesson 15:   Multiply non-unit fractions by non-unit fractions.

engage^{ny}

c. $\dfrac{2}{3} \times \dfrac{6}{7}$

d. $\dfrac{4}{9} \times \dfrac{3}{10}$

3. Phillip's family traveled $\dfrac{3}{10}$ of the distance to his grandmother's house on Saturday. They traveled $\dfrac{4}{7}$ of the remaining distance on Sunday. What fraction of the total distance to his grandmother's house was traveled on Sunday?

4. Santino bought a $\dfrac{3}{4}$-pound bag of chocolate chips. He used $\dfrac{2}{3}$ of the bag while baking. How many pounds of chocolate chips did he use while baking?

5. Farmer Dave harvested his corn. He stored $\dfrac{5}{9}$ of his corn in one large silo and $\dfrac{3}{4}$ of the remaining corn in a small silo. The rest was taken to market to be sold.

   a. What fraction of the corn was stored in the small silo?

   b. If he harvested 18 tons of corn, how many tons did he take to market?

EUREKA MATH™

Lesson 15:   Multiply non-unit fractions by non-unit fractions.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original
(cc) BY-NC-SA   This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

Solve and show your thinking with a tape diagram.

1. Mrs. Onusko made 60 cookies for a bake sale. She sold $\frac{2}{3}$ of them and gave $\frac{3}{4}$ of the remaining cookies to the students working at the sale. How many cookies did she have left?

2. Joakim is icing 30 cupcakes. He spreads mint icing on $\frac{1}{5}$ of the cupcakes and chocolate on $\frac{1}{2}$ of the remaining cupcakes. The rest will get vanilla icing. How many cupcakes have vanilla icing?

3. The Booster Club sells 240 cheeseburgers. $\frac{1}{4}$ of the cheeseburgers had pickles, $\frac{1}{2}$ of the remaining burgers had onions, and the rest had tomato. How many cheeseburgers had tomato?

EUREKA MATH™

Lesson 16: Solve word problems using tape diagrams and fraction-by-fraction multiplication.

engage^ny

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

4. DeSean is sorting his rock collection. $\frac{2}{3}$ of the rocks are metamorphic, and $\frac{3}{4}$ of the remainder are igneous rocks. If the 3 rocks left over are sedimentary, how many rocks does DeSean have?

5. Milan puts $\frac{1}{4}$ of her lawn-mowing money in savings and uses $\frac{1}{2}$ of the remaining money to pay back her sister. If she has $15 left, how much did she have at first?

6. Parks is wearing several rubber bracelets. $\frac{1}{3}$ of the bracelets are tie-dye, $\frac{1}{6}$ are blue, and $\frac{1}{3}$ of the remainder are camouflage. If Parks wears 2 camouflage bracelets, how many bracelets does he have on?

7. Ahmed spent $\frac{1}{3}$ of his money on a burrito and a water bottle. The burrito cost 2 times as much as the water. The burrito cost $4. How much money does Ahmed have left?

EUREKA MATH™

Lesson 16: Solve word problems using tape diagrams and fraction-by-fraction multiplication.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____ Date _____

1. Multiply and model. Rewrite each expression as a multiplication sentence with decimal factors. The first one is done for you.

a. $\frac{1}{10} \times \frac{1}{10}$

$= \frac{1 \times 1}{10 \times 10}$

$= \frac{1}{100}$
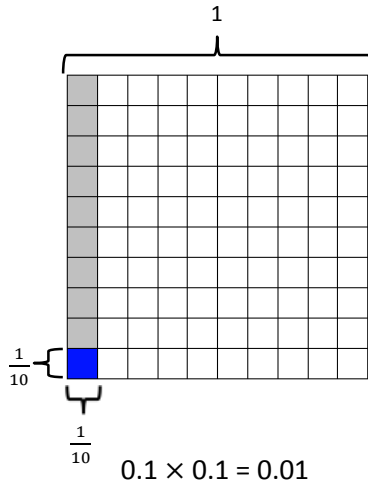
$0.1 \times 0.1 = 0.01$

b. $\frac{4}{10} \times \frac{3}{10}$
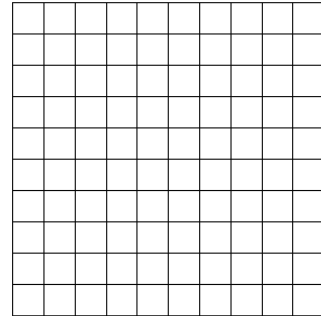
c. $\frac{1}{10} \times 1.4$
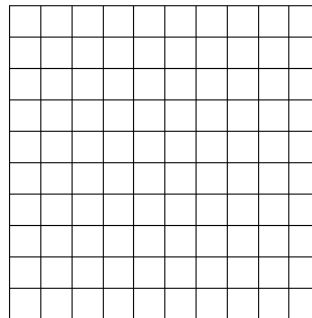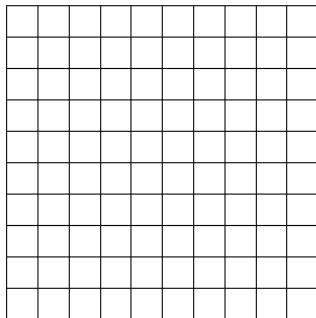
d. $\frac{6}{10} \times 1.7$

2. Multiply. The first few are started for you.

   a. $5 \times 0.7 = \underline{\hspace{1.5cm}}$

   $= 5 \times \dfrac{7}{10}$

   $= \dfrac{5 \times 7}{10}$

   $= \dfrac{35}{10}$

   $= 3.5$

   b. $0.5 \times 0.7 = \underline{\hspace{1.5cm}}$

   $= \dfrac{5}{10} \times \dfrac{7}{10}$

   $= \dfrac{5 \times 7}{10 \times 10}$

   $=$

   c. $0.05 \times 0.7 = \underline{\hspace{1.5cm}}$

   $= \dfrac{5}{100} \times \dfrac{7}{10}$

   $= \dfrac{\underline{\hspace{0.3cm}} \times \underline{\hspace{0.3cm}}}{100 \times 10}$

   $=$

   d. $6 \times 0.3 = \underline{\hspace{1.5cm}}$

   e. $0.6 \times 0.3 = \underline{\hspace{1.5cm}}$

   f. $0.06 \times 0.3 = \underline{\hspace{1.5cm}}$

   g. $1.2 \times 4 = \underline{\hspace{1.5cm}}$

   h. $1.2 \times 0.4 = \underline{\hspace{1.5cm}}$

   i. $0.12 \times 0.4 = \underline{\hspace{1.5cm}}$

3. A Boy Scout has a length of rope measuring 0.7 meter. He uses 2 tenths of the rope to tie a knot at one end. How many meters of rope are in the knot?

4. After just 4 tenths of a 2.5-mile race was completed, Lenox took the lead and remained there until the end of the race.

   a. How many miles did Lenox lead the race?

   b. Reid, the second-place finisher, developed a cramp with 3 tenths of the race remaining. How many miles did Reid run without a cramp?

Name _____   Date _____

1. Multiply using both fraction form and unit form. Check your answer by counting the decimal places.
    The first one is done for you.

a. $2.3 \times 1.8 = \frac{23}{10} \times \frac{18}{10}$

$= \frac{23 \times 18}{100}$

$= \frac{414}{100}$

$= 4.14$

		2	3	tenths
×		1	8	tenths
	1	8	4	
+	2	3	0	
	4	1	4	hundredths

b. $2.3 \times 0.9 =$

		2	3	tenths
×			9	tenths

c. $6.6 \times 2.8 =$

d. $3.3 \times 1.4 =$

2. Multiply using fraction form and unit form. Check your answer by counting the decimal places.
    The first one is done for you.

a. $2.38 \times 1.8 = \frac{238}{100} \times \frac{18}{10}$

$= \frac{238 \times 18}{1,000}$

$= \frac{4,284}{1,000}$

$= 4.284$

		2	3	8	hundredths
×			1	8	tenths
	1	9	0	4	
+	2	3	8	0	
4,	2	8	4		thousandths

b. $2.37 \times 0.9 =$

		2	3	7	hundredths
×				9	tenths

c. $6.06 \times 2.8 =$

d. $3.3 \times 0.14 =$

EUREKA MATH™

engage^{ny}

3. Solve using the standard algorithm. Show your thinking about the units of your product. The first one is done for you.

   a. $3.2 \times 0.6 = 1.92$

   $$
   \begin{array}{r}
   3\ 2 \text{ tenths} \\
   \times \quad 6 \text{ tenths} \\
   \hline
   1\ 9\ 2 \text{ hundredths}
   \end{array}
   $$

   $\dfrac{32}{10} \times \dfrac{6}{10} = \dfrac{32 \times 6}{100}$

   b. $3.2 \times 1.2 =$ _____

   $$
   \begin{array}{r}
   3\ \ 2 \text{ tenths} \\
   \times \quad 1\ \ 2 \text{ tenths} \\
   \hline
   \end{array}
   $$

   c. $8.31 \times 2.4 =$ _____

   d. $7.50 \times 3.5 =$ _____

4. Carolyn buys 1.2 pounds of chicken breast. If each pound of chicken breast costs $3.70, how much will she pay for the chicken breast?

5. A kitchen measures 3.75 meters by 4.2 meters.

   a. Find the area of the kitchen.

   b. The area of the living room is one and a half times that of the kitchen. Find the total area of the living room and the kitchen.

EUREKA MATH™

Lesson 18: Relate decimal and fraction multiplication.

engage^ny

Name _____   Date _____

1. Convert. Express your answer as a mixed number, if possible. The first one is done for you.

---

a. 2 ft = _____ $\frac{2}{3}$ _____ yd

    2 ft = 2 × 1 ft

        = 2 × $\frac{1}{3}$ yd

        = $\frac{2}{3}$ yd

b. 4 ft = _____ yd

    4 ft = 4 × 1 ft

        = 4 × _____ yd

        = _____ yd

        =

---

c. 7 in = _____ ft

d. 13 in = _____ ft

---

e. 5 oz = _____ lb

f. 18 oz = _____ lb

EUREKA MATH

Lesson 19: Convert measures involving whole numbers, and solve multi-step word problems.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

2. Regina buys 24 inches of trim for a craft project.

   a. What fraction of a yard does Regina buy?

   b. If a whole yard of trim costs $6, how much did Regina pay?

3. At Yo-Yo Yogurt, the scale says that Sara has 8 ounces of vanilla yogurt in her cup. Her father's yogurt weighs 11 ounces. How many pounds of frozen yogurt did they buy altogether? Express your answer as a mixed number.

4. Pheng-Xu drinks 1 cup of milk every day for lunch. How many gallons of milk does he drink in 2 weeks?

EUREKA MATH

Lesson 19:   Convert measures involving whole numbers, and solve multi-step word problems.

engage^ny

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____ Date _____

1. Convert. Show your work. Express your answer as a mixed number. (Draw a tape diagram if it helps you.) The first one is done for you.

a. $2\frac{2}{3}$ yd = __8__ ft $2\frac{2}{3}$ yd $= 2\frac{2}{3} \times 1$ yd $\quad = 2\frac{2}{3} \times 3$ ft $\quad = \frac{8}{3} \times 3$ ft $\quad = \frac{24}{3}$ ft $\quad = 8$ ft	b. $1\frac{1}{2}$ qt = _____ gal $1\frac{1}{2}$ qt $= 1\frac{1}{2} \times 1$ qt $\quad = 1\frac{1}{2} \times \frac{1}{4}$ gal $\quad = \frac{3}{2} \times \frac{1}{4}$ gal $\quad =$
c. $4\frac{2}{3}$ ft = _____ in	d. $9\frac{1}{2}$ pt = _____ qt
e. $3\frac{3}{5}$ hr = _____ min	f. $3\frac{2}{3}$ ft = _____ yd

EUREKA MATH™

Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.

engage^{ny}

2. Three dump trucks are carrying topsoil to a construction site. Truck A carries 3,545 lb, Truck B carries 1,758 lb, and Truck C carries 3,697 lb. How many tons of topsoil are the 3 trucks carrying altogether?

3. Melissa buys $3\frac{3}{4}$ gallons of iced tea. Denita buys 7 quarts more than Melissa. How much tea do they buy altogether? Express your answer in quarts.

4. Marvin buys a hose that is $27\frac{3}{4}$ feet long. He already owns a hose at home that is $\frac{2}{3}$ the length of the new hose. How many total yards of hose does Marvin have now?

EUREKA MATH

Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.

engage^ny

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

1. Fill in the blanks. The first one has been done for you.

   a. $\frac{1}{4} \times 1 = \frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$

   b. $\frac{3}{4} \times 1 = \frac{3}{4} \times \text{---} = \frac{21}{28}$

   c. $\frac{7}{4} \times 1 = \frac{7}{4} \times \text{---} = \frac{35}{20}$

   d. Use words to compare the size of the product to the size of the first factor.

2. Express each fraction as an equivalent decimal.

   a. $\frac{1}{4} \times \frac{25}{25} =$

   b. $\frac{3}{4} \times \frac{25}{25} =$

   c. $\frac{1}{5} \times \text{---} =$

   d. $\frac{4}{5} \times \text{---} =$

   e. $\frac{1}{20}$

   f. $\frac{27}{20}$

   g. $\frac{7}{4}$

   h. $\frac{8}{5}$

   i. $\frac{24}{25}$

   j. $\frac{93}{50}$

   k. $2\frac{6}{25}$

   l. $3\frac{31}{50}$

EUREKA MATH™

Lesson 21: Explain the size of the product, and relate fraction and decimal equivalence to multiplying a fraction by 1.

engage^{ny}

3. Jack said that if you take a number and multiply it by a fraction, the product will always be smaller than what you started with. Is he correct? Why or why not? Explain your answer, and give at least two examples to support your thinking.

4. There is an infinite number of ways to represent 1 on the number line. In the space below, write at least four expressions multiplying by 1. Represent *one* differently in each expression.

5. Maria multiplied by 1 to rename $\frac{1}{4}$ as hundredths. She made factor pairs equal to 10. Use her method to change one-eighth to an equivalent decimal.

Maria's way: $\frac{1}{4} = \frac{1}{2 \times 2} \times \frac{5 \times 5}{5 \times 5} = \frac{5 \times 5}{(2 \times 5) \times (2 \times 5)} = \frac{25}{100} = 0.25$

$\frac{1}{8} =$

Paulo renamed $\frac{1}{8}$ as a decimal, too. He knows the decimal equal to $\frac{1}{4}$, and he knows that $\frac{1}{8}$ is half as much as $\frac{1}{4}$. Can you use his ideas to show another way to find the decimal equal to $\frac{1}{8}$?

EUREKA MATH™

Lesson 21: Explain the size of the product, and relate fraction and decimal equivalence to multiplying a fraction by 1.

engage^ny

Modified from original
© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____ Date _____

1. Solve for the unknown. Rewrite each phrase as a multiplication sentence. Circle the scaling factor and put a box around the number of meters.

   a. $\frac{1}{2}$ as long as 8 meters = _____ meter(s)   b. 8 times as long as $\frac{1}{2}$ meter = _____ meter(s)

2. Draw a tape diagram to model each situation in Problem 1, and describe what happened to the number of meters when it was multiplied by the scaling factor.

   a.   b.

3. Fill in the blank with a numerator or denominator to make the number sentence true.

   a. $7 \times \frac{}{4} < 7$ b. $\frac{7}{} \times 15 > 15$ c. $3 \times \frac{}{5} = 3$

4. Look at the inequalities in each box. Choose a single fraction to write in all three blanks that would make all three number sentences true. Explain how you know.

   a.
$\frac{3}{4} \times$ ____ $> \frac{3}{4}$	$2 \times$ ____ > 2	$\frac{7}{5} \times$ ____ $> \frac{7}{5}$

   b.
$\frac{3}{4} \times$ ____ $< \frac{3}{4}$	$2 \times$ ____ < 2	$\frac{7}{5} \times$ ____ $< \frac{7}{5}$

EUREKA MATH™   Lesson 22:   Compare the size of the product to the size of the factors.   engage^ny

5. Johnny says multiplication always makes numbers bigger. Explain to Johnny why this isn't true.
   Give more than one example to help him understand.

6. A company uses a sketch to plan an advertisement on the side of a building. The lettering on the sketch is $\frac{3}{4}$ inch tall. In the actual advertisement, the letters must be 34 times as tall. How tall will the letters be on the building?

7. Jason is drawing the floor plan of his bedroom. He is drawing everything with dimensions that are $\frac{1}{12}$ of the actual size. His bed measures 6 ft by 3 ft, and the room measures 14 ft by 16 ft. What are the dimensions of his bed and room in his drawing?

EUREKA MATH™

Lesson 22: Compare the size of the product to the size of the factors.

engage^{ny}

Name _____ Date _____

1. Fill in the blank using one of the following scaling factors to make each number sentence true.

| 1.021 | 0.989 | 1.00 |

a. 3.4 × _____ = 3.4   b. _____ × 0.21 > 0.21   c. 8.04 × _____ < 8.04

2.
   a. Sort the following expressions by rewriting them in the table.

The product is less than the boxed number:	The product is greater than the boxed number:

13.89 × 1.004   602 × 0.489   102.03 × 4.015

0.3 × 0.069   0.72 × 1.24   0.2 × 0.1

   b. Explain your sorting by writing a sentence that tells what the expressions in each column of the table have in common.

EUREKA MATH™

Lesson 23:   Compare the size of the product to the size of the factors.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

(cc) BY-NC-SA   This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

3. Write a statement using one of the following phrases to compare the value of the expressions. Then, explain how you know.

   is slightly more than   _is a lot more than_   _is slightly less than_   _is a lot less than_

   a. 4 × 0.988   _____   4

   b. 1.05 × 0.8   _____   0.8

   c. 1,725 × 0.013   _____   1,725

   d. 989.001 × 1.003   _____   1.003

   e. 0.002 × 0.911   _____   0.002

EUREKA
MATH™

Lesson 23:   Compare the size of the product to the size of the factors.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original
(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

4. During science class, Teo, Carson, and Dhakir measure the length of their bean sprouts. Carson's sprout is 0.9 times the length of Teo's, and Dhakir's is 1.08 times the length of Teo's. Whose bean sprout is the longest? The shortest? Explain your reasoning.

5. Complete the following statements; then use decimals to give an example of each.

   ▪ *a × b > a* will always be true when *b* is…

   ▪ *a × b < a* will always be true when *b* is…

Lesson 23:   Compare the size of the product to the size of the factors.

engage^{ny}

Name _____   Date _____

1. A vial contains 20 mL of medicine. If each dose is $\frac{1}{8}$ of the vial, how many mL is each dose? Express your answer as a decimal.

2. A container holds 0.7 liters of oil and vinegar. $\frac{3}{4}$ of the mixture is vinegar. How many liters of vinegar are in the container? Express your answer as both a fraction and a decimal.

EUREKA MATH™

Lesson 24: Solve word problems using fraction and decimal multiplication.

engage^{ny}

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

3. Andres completed a 5-km race in 13.5 minutes. His sister's time was $1\frac{1}{2}$ times longer than his time. How long, in minutes, did it take his sister to run the race?

4. A clothing factory uses 1,275.2 meters of cloth a week to make shirts. How much cloth is needed to make $3\frac{3}{5}$ times as many shirts?

EUREKA MATH

Lesson 24: Solve word problems using fraction and decimal multiplication.

engage^ny

Modified from original

5. There are $\frac{3}{4}$ as many boys as girls in a class of fifth-graders. If there are 35 students in the class, how many are girls?

6. Ciro purchased a concert ticket for $56. The cost of the ticket was $\frac{4}{5}$ the cost of his dinner. The cost of his hotel was $2\frac{1}{2}$ times as much as his ticket. How much did Ciro spend altogether for the concert ticket, hotel, and dinner?

EUREKA MATH™

Lesson 24:   Solve word problems using fraction and decimal multiplication.

engage^{ny}
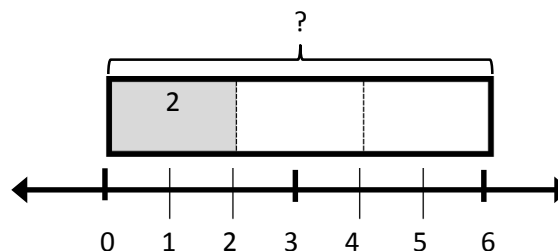
Name _____   Date _____

1. Draw a tape diagram and a number line to solve. You may draw the model that makes the most sense to you. Fill in the blanks that follow. Use the example to help you.

Example: $2 \div \frac{1}{3} =$ __6__
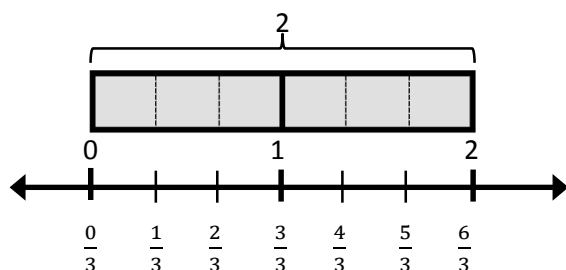
There are __3__ thirds in 1 whole.

There are __6__ thirds in 2 wholes.

If 2 is $\frac{1}{3}$, what is the whole? __6__

a. $4 \div \frac{1}{2} =$ _____

There are ____ halves in 1 whole.
There are ____ halves in 4 wholes.

If 4 is $\frac{1}{2}$, what is the whole? _____

b. $2 \div \frac{1}{4} =$ _____

There are ____ fourths in 1 whole.
There are ____ fourths in 2 wholes.

If 2 is $\frac{1}{4}$, what is the whole? _____

EUREKA MATH

Lesson 25:   Divide a whole number by a unit fraction.

engage^ny

c. $5 \div \frac{1}{3} = $ _____   There are _____ thirds in 1 whole.   If 5 is $\frac{1}{3}$, what is the whole? _____

There are _____ thirds in 5 wholes.

d. $3 \div \frac{1}{5} = $ _____   There are _____ fifths in 1 whole.   If 3 is $\frac{1}{5}$, what is the whole? _____

There are _____ fifths in 3 wholes.

2. Divide. Then, multiply to check.

a. $5 \div \frac{1}{2}$	b. $3 \div \frac{1}{2}$	c. $4 \div \frac{1}{5}$	d. $1 \div \frac{1}{6}$
e. $2 \div \frac{1}{8}$	f. $7 \div \frac{1}{6}$	g. $8 \div \frac{1}{3}$	h. $9 \div \frac{1}{4}$

EUREKA MATH™

Lesson 25:   Divide a whole number by a unit fraction.

engage^{ny}

Modified from original

3. For an art project, Mrs. Williams is dividing construction paper into fourths. How many fourths can she make from 5 pieces of construction paper?

4. Use the chart below to answer the following questions.

Donnie's Diner Lunch Menu

Food	Serving Size
Hamburger	$\frac{1}{3}$ lb
Pickles	$\frac{1}{4}$ pickle
Potato chips	$\frac{1}{8}$ bag
Chocolate milk	$\frac{1}{2}$ cup

a. How many hamburgers can Donnie make with 6 pounds of hamburger meat?

b. How many pickle servings can be made from a jar of 15 pickles?

EUREKA MATH

Lesson 25:   Divide a whole number by a unit fraction.

engage^{ny}
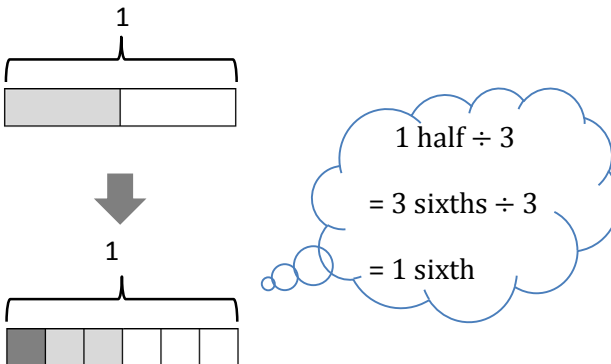
Modified from original

c. How many servings of chocolate milk can he serve from a gallon of milk?

5. Three gallons of water fill $\frac{1}{4}$ of the elephant's pail at the zoo. How much water does the pail hold?

EUREKA MATH™

Lesson 25:   Divide a whole number by a unit fraction.

engage^{ny}

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____ Date _____

1. Draw a model or tape diagram to solve. Use the thought bubble to show your thinking. Write your quotient in the blank. Use the example to help you.

Example: $\frac{1}{2} \div 3$

1 half ÷ 3

= 3 sixths ÷ 3

= 1 sixth

$\frac{1}{2} \div 3 = \frac{1}{6}$

a. $\frac{1}{3} \div 2 =$ _____

b. $\frac{1}{3} \div 4 =$ _____

c. $\frac{1}{4} \div 2 = $ _____

d. $\frac{1}{4} \div 3 = $ _____

2.   Divide. Then, multiply to check.

a. $\frac{1}{2} \div 7$	b. $\frac{1}{3} \div 6$	c. $\frac{1}{4} \div 5$	d. $\frac{1}{5} \div 4$
e. $\frac{1}{5} \div 2$	f. $\frac{1}{6} \div 3$	g. $\frac{1}{8} \div 2$	h. $\frac{1}{10} \div 10$

Lesson 26:   Divide a unit fraction by a whole number.

engage^{ny}

Modified from original

3. Tasha eats half her snack and gives the other half to her two best friends for them to share equally. What portion of the whole snack does each friend get? Draw a picture to support your response.

4. Mrs. Appler used $\frac{1}{2}$ gallon of olive oil to make 8 identical batches of salad dressing.

   a. How many gallons of olive oil did she use in each batch of salad dressing?

   b. How many cups of olive oil did she use in each batch of salad dressing?

5. Mariano delivers newspapers. He always puts $\frac{3}{4}$ of his weekly earnings in his savings account and then divides the rest equally into 3 piggy banks for spending at the snack shop, the arcade, and the subway.

   a. What fraction of his earnings does Mariano put into each piggy bank?

   b. If Mariano adds $2.40 to each piggy bank every week, how much does Mariano earn per week delivering papers?

Name _____   Date _____

1. Mrs. Silverstein bought 3 mini cakes for a birthday party. She cuts each cake into quarters and plans to serve each guest 1 quarter of a cake. How many guests can she serve with all her cakes? Draw a picture to support your response.

2. Mr. Pham has $\frac{1}{4}$ pan of lasagna left in the refrigerator. He wants to cut the lasagna into equal slices so he can have it for dinner for 3 nights. How much lasagna will he eat each night? Draw a picture to support your response.

3. The perimeter of a square is $\frac{1}{5}$ of a meter.

    a. Find the length of each side in meters. Draw a picture to support your response.

    b. How long is each side in centimeters?

4. A pallet holding 5 identical crates weighs $\frac{1}{4}$ of a ton.

    a. How many tons does each crate weigh? Draw a picture to support your response.

EUREKA MATH™

Lesson 27:   Solve problems involving fraction division.

engage^ny

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original
BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

b.   How many pounds does each crate weigh?

5.   Faye has 5 pieces of ribbon, each 1 yard long. She cuts each ribbon into sixths.

   a.   How many sixths will she have after cutting all the ribbons?

   b.   How long will each of the sixths be in inches?

6. A glass pitcher is filled with water. $\frac{1}{8}$ of the water is poured equally into 2 glasses.

   a. What fraction of the water is in each glass?

   b. If each glass has 3 fluid ounces of water in it, how many fluid ounces of water were in the full pitcher?

   c. If $\frac{1}{4}$ of the remaining water is poured out of the pitcher to water a plant, how many cups of water are left in the pitcher?

EUREKA MATH™

Lesson 27: Solve problems involving fraction division.

engage^ny

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

1. Divide. Rewrite each expression as a division sentence with a fraction divisor, and fill in the blanks. The first one is done for you.

Example: $2 \div 0.1 = 2 \div \frac{1}{10} = 20$

There are __10__ tenths in 1 whole.

There are __20__ tenths in 2 wholes.

a. $5 \div 0.1$

There are _____ tenths in 1 whole.

There are _____ tenths in 5 wholes.

b. $8 \div 0.1$

There are _____ tenths in 1 whole.

There are _____ tenths in 8 wholes.

c. $5.2 \div 0.1$

There are _____ tenths in 5 wholes.

There are _____ tenths in 2 tenths.

There are _____ tenths in 5.2.

d. $8.7 \div 0.1$

There are _____ tenths in 8 wholes.

There are _____ tenths in 7 tenths.

There are _____ tenths in 8.7.

e. $5 \div 0.01$

There are _____ hundredths in 1 whole.

There are _____ hundredths in 5 wholes.

f. $8 \div 0.01$

There are _____ hundredths in 1 whole.

There are _____ hundredths in 8 wholes.

g. $5.2 \div 0.01$

There are _____ hundredths in 5 wholes.

There are _____ hundredths in 2 tenths.

There are _____ hundredths in 5.2.

h. $8.7 \div 0.01$

There are _____ hundredths in 8 wholes.

There are _____ hundredths in 7 tenths.

There are _____ hundredths in 8.7.

EUREKA MATH™

Lesson 29:   Connect division by a unit fraction to division by 1 tenth and 1 hundredth.

engage^{ny}

2. Divide.

a. $6 \div 0.1$	b. $18 \div 0.1$	c. $6 \div 0.01$
d. $1.7 \div 0.1$	e. $31 \div 0.01$	f. $11 \div 0.01$
g. $125 \div 0.1$	h. $3.74 \div 0.01$	i. $12.5 \div 0.01$

3. Yung bought $4.60 worth of bubble gum. Each piece of gum cost $0.10. How many pieces of bubble gum did Yung buy?

4. Cheryl solved a problem: $84 \div 0.01 = 8{,}400$.

   Jane said, "Your answer is wrong because when you divide, the quotient is always smaller than the whole amount you start with, for example, $6 \div 2 = 3$ and $100 \div 4 = 25$." Who is correct? Explain your thinking.

5. The U.S. Mint sells 2 ounces of American Eagle gold coins to a collector. Each coin weighs one-tenth of an ounce. How many gold coins were sold to the collector?

Name _____   Date _____

1. Rewrite the division expression as a fraction and divide. The first two have been started for you.

a. $2.7 \div 0.3 = \dfrac{2.7}{0.3}$ $= \dfrac{2.7 \times 10}{0.3 \times 10}$ $= \dfrac{27}{3}$ $= 9$	b. $2.7 \div 0.03 = \dfrac{2.7}{0.03}$ $= \dfrac{2.7 \times 100}{0.03 \times 100}$ $= \dfrac{270}{3}$ $=$
c. $3.5 \div 0.5$	d. $3.5 \div 0.05$
e. $4.2 \div 0.7$	f. $0.42 \div 0.07$

Lesson 30:   Divide decimal dividends by non-unit decimal divisors.

engage^{ny}

g. $10.8 \div 0.9$	h. $1.08 \div 0.09$
i. $3.6 \div 1.2$	j. $0.36 \div 0.12$
k. $17.5 \div 2.5$	l. $1.75 \div 0.25$

2. $15 \div 3 = 5$. Explain why it is true that $1.5 \div 0.3$ and $0.15 \div 0.03$ have the same quotient.

3. Mr. Volok buys 2.4 kg of sugar for his bakery.

   a. If he pours 0.2 kg of sugar into separate bags, how many bags of sugar can he make?

   b. If he pours 0.4 kg of sugar into separate bags, how many bags of sugar can he make?

4. Two wires, one 17.4 meters long and one 7.5 meters long, were cut into pieces 0.3 meters long. How many such pieces can be made from both wires?

5. Mr. Smith has 15.6 pounds of oranges to pack for shipment. He can ship 2.4 pounds of oranges in a large box and 1.2 pounds in a small box. If he ships 5 large boxes, what is the minimum number of small boxes required to ship the rest of the oranges?

EUREKA MATH™

engage^ny

Start of Homework section for Mission 4

Name _____   Date _____

A meteorologist set up rain gauges at various locations around a city and recorded the rainfall amounts in the table below. Use the data in the table to create a line plot using $\frac{1}{8}$ inches.

$\longleftarrow$ _____ $\longrightarrow$
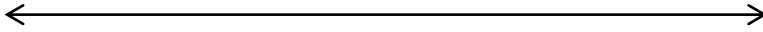
a. Which location received the most rainfall?

b. Which location received the least rainfall?

c. Which rainfall measurement was the most frequent?

d. What is the total rainfall in inches?

Location	Rainfall Amount (inches)
1	$\frac{1}{8}$
2	$\frac{3}{8}$
3	$\frac{3}{4}$
4	$\frac{3}{4}$
5	$\frac{1}{4}$
6	$1\frac{1}{4}$
7	$\frac{1}{8}$
8	$\frac{1}{4}$
9	1
10	$\frac{1}{8}$

EUREKA MATH™

Lesson 1: Measure and compare pencil lengths to the nearest $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ of an inch, and analyze the data through line plots.

Modified from original

engage^ny

26

Name _____   Date _____

1. Draw a picture to show the division. Express your answer as a fraction.

   a. $1 \div 4$

   b. $3 \div 5$

   c. $7 \div 4$

2. Using a picture, show how six people could share four sandwiches. Then, write an equation and solve.

3. Fill in the blanks to make true number sentences.

a. $2 \div 7 = \dfrac{}{}$

b. $39 \div 5 = \dfrac{}{}$

c. $13 \div 3 = \dfrac{}{}$

d. $\dfrac{9}{5} = $ _____ $\div$ _____

e. $\dfrac{19}{28} = $ _____ $\div$ _____

f. $1\dfrac{3}{5} = $ _____ $\div$ _____

Name _____   Date _____

1. Fill in the chart. The first one is done for you.

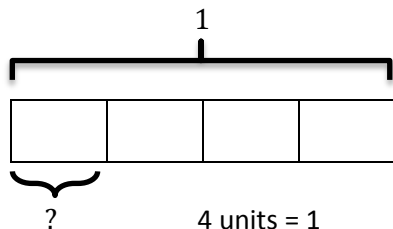| Division Expression	Unit Forms	Improper Fractions	Mixed Numbers	Standard Algorithm (Write your answer in whole numbers and fractional units. Then check.)
a. $4 \div 3$	12 thirds ÷ 3 = 4 thirds	$\frac{4}{3}$	$1\frac{1}{3}$	$3\overline{)4}$ with $1\frac{1}{3}$ above, -3, 1 Check $3 \times 1\frac{1}{3} = 1\frac{1}{3} + 1\frac{1}{3} + 1\frac{1}{3}$ $= 3 + \frac{3}{3}$ $= 3 + 1$ $= 4$
b. ___ ÷ ___	___ fifths ÷ 5 = ___ fifths		$1\frac{2}{5}$	
c. ___ ÷ ___	___ halves ÷ 2 = ___ halves			$2\overline{)7}$
d. $7 \div 4$		$\frac{7}{4}$		

2. A coffee shop uses 4 liters of milk every day.

   a. If there are 15 liters of milk in the refrigerator, after how many days will more milk need to be purchased? Explain how you know.

   b. If only half as much milk is used each day, after how many days will more milk need to be purchased?

3. Polly buys 14 cupcakes for a party.   The bakery puts them into boxes that hold 4 cupcakes each.

   a. How many boxes will be needed for Polly to bring all the cupcakes to the party? Explain how you know.

   b. If the bakery completely fills as many boxes as possible, what fraction of the last box is empty? How many more cupcakes are needed to fill this box?

Modified from original

Name _____   Date _____

1. Draw a tape diagram to solve. Express your answer as a fraction. Show the addition sentence to support your answer. The first one is done for you.

a. $1 \div 4 = \frac{1}{4}$

Check:

$4 \times \frac{1}{4}$

1

?   4 units = 1

1 unit = 1 ÷ 4

$= \frac{1}{4}$

$4 \overline{\smash{)}1}$ $0 \quad \frac{1}{4}$

- 0

1

$= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

$= \frac{4}{4}$

$= 1$

b. $4 \div 5 = $ ▬

c. $8 \div 5 = $ ▬

d. $14 \div 3 = $ ▬

EUREKA MATH™

Lesson 4:   Use tape diagrams to model fractions as division.

engage^ny

67

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

2. Fill in the chart. The first one is done for you.

Division Expression	Fraction	Between which two whole numbers is your answer?	Standard Algorithm
a. 16 ÷ 5	$\dfrac{16}{5}$	3 and 4	$\begin{array}{r} 3\tfrac{1}{5} \\ 5\overline{\smash{\big)}\,16} \\ \underline{-15} \\ 1 \end{array}$
b. ____ ÷ ____	$\dfrac{3}{4}$	0 and 1	
c. ____ ÷ ____	$\dfrac{7}{2}$		$2\overline{\smash{\big)}\,7}$
d. ____ ÷ ____	$\dfrac{81}{90}$		

3. Jackie cut a 2-yard spool into 5 equal lengths of ribbon.

   a. What is the length of each ribbon in yards? Draw a tape diagram to show your thinking.

   b. What is the length of each ribbon in feet? Draw a tape diagram to show your thinking.

4. Baa Baa, the black sheep, had 7 pounds of wool. If he separated the wool equally into 3 bags, how much wool would be in 2 bags?

5. An adult sweater is made from 2 pounds of wool. This is 3 times as much wool as it takes to make a baby sweater. How much wool does it take to make a baby sweater? Use a tape diagram to solve.

Name _____   Date _____

1. When someone donated 14 gallons of paint to Rosendale Elementary School, the fifth grade decided to use it to paint murals. They split the gallons equally among the four classes.

    a. How much paint did each class have to paint their mural?

    b. How much paint will three classes use? Show your thinking using words, numbers, or pictures.

    c. If 4 students share a 30-square-foot wall equally, how many square feet of the wall will be painted by each student?

    d. What fraction of the wall will each student paint?
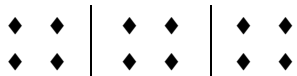
Lesson 5:   Solve word problems involving the division of whole numbers with answers in the form of fractions or whole numbers.

83

Modified from original

2. Craig bought a 3-foot-long baguette and then made 4 equally sized sandwiches with it.

    a. What portion of the baguette was used for each sandwich? Draw a visual model to help you solve this problem.

    b. How long, in feet, is one of Craig's sandwiches?

    c. How many inches long is one of Craig's sandwiches?

3. Scott has 6 days to save enough money for a $45 concert ticket. If he saves the same amount each day, what is the minimum amount he must save each day in order to reach his goal? Express your answer in dollars.

EUREKA MATH™

Lesson 5: Solve word problems involving the division of whole numbers with answers in the form of fractions or whole numbers.

engage^ny   84

Name _____   Date _____

1. Find the value of each of the following.

    a.

    $\frac{1}{3}$ of 12 =

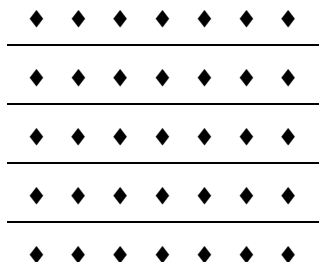 $\frac{2}{3}$ of 12 =

    $\frac{3}{3}$ of 12 =

    b.
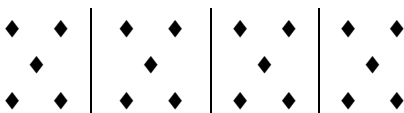
    $\frac{1}{4}$ of 20 = $\frac{3}{4}$ of 20 =

    $\frac{2}{4}$ of 20 = $\frac{4}{4}$ of 20 =

    c.

    $\frac{1}{5}$ of 35 = $\frac{3}{5}$ of 35 = $\frac{5}{5}$ of 35 =

    $\frac{2}{5}$ of 35 = $\frac{4}{5}$ of 35 = $\frac{6}{5}$ of 35 =

EUREKA MATH™

Lesson 6: Relate fractions as division to fraction of a set.

engage^{ny}

Modified from original

2. Find $\frac{2}{3}$ of 18. Draw a set and shade to show your thinking.

3. How does knowing $\frac{1}{5}$ of 10 help you find $\frac{3}{5}$ of 10? Draw a picture to explain your thinking.

4. Sara just turned 18 years old. She spent $\frac{4}{9}$ of her life living in Rochester, NY. How many years did Sara live in Rochester?

5. A farmer collected 12 dozen eggs from her chickens. She sold $\frac{5}{6}$ of the eggs at the farmers' market and gave the rest to friends and neighbors.

   a. How many dozen eggs did the farmer give away? How many eggs did she give away?

   b. She sold each dozen for $4.50. How much did she earn from the eggs she sold?

EUREKA MATH

Lesson 6: Relate fractions as division to fraction of a set.

engage^ny   100

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

Name _____   Date _____

1. Solve using a tape diagram.

    a. $\frac{1}{4}$ of 24

    b. $\frac{1}{4}$ of 48

    c. $\frac{2}{3} \times 18$

    d. $\frac{2}{6} \times 18$

    e. $\frac{3}{7} \times 49$

    f. $\frac{3}{10} \times 120$

    g. $\frac{1}{3} \times 31$

    h. $\frac{2}{5} \times 20$

    i. $\frac{1}{4} \times 25$

   j. $\frac{3}{4} \times 25$

    k. $\frac{3}{4}$ of a number is 27. What's the number?

    l. $\frac{2}{5}$ of a number is 14. What's the number?

2. Solve using tape diagrams.

    a. A skating rink sold 66 tickets. Of these, $\frac{2}{3}$ were children's tickets, and the rest were adult tickets. What total number of adult tickets were sold?

    b. A straight angle is split into two smaller angles as shown. The smaller angle's measure is $\frac{1}{6}$ that of a straight angle. What is the value of angle a?
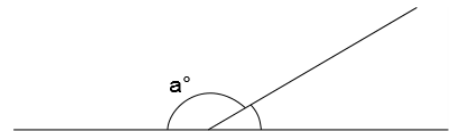
    c. Annabel and Eric made 17 ounces of pizza dough. They used $\frac{5}{8}$ of the dough to make a pizza and used the rest to make calzones. What is the difference between the amount of dough they used to make pizza and the amount of dough they used to make calzones?

    d. The New York Rangers hockey team won $\frac{3}{4}$ of their games last season. If they lost 21 games, how many games did they play in the entire season?

Modified from original

Name _____   Date _____

1. Rewrite the following expressions as shown in the example.

Example: $\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}=\frac{4\times2}{3}=\frac{8}{3}$

a. $\frac{5}{3}+\frac{5}{3}+\frac{5}{3}$

b. $\frac{13}{5}+\frac{13}{5}$

c. $\frac{9}{4}+\frac{9}{4}+\frac{9}{4}$

2. Solve each problem in two different ways as modeled in the example.

Example: $\frac{2}{3}\times6=\frac{2\times6}{3}=\frac{12}{3}=4$ $\frac{2}{3}\times6=\frac{2\times\cancel{6}^{2}}{\cancel{3}_{1}}=4$

a. $\frac{3}{4}\times16$ $\frac{3}{4}\times16$

b. $\frac{4}{3}\times12$ $\frac{4}{3}\times12$

c. $40\times\frac{11}{10}$ $40\times\frac{11}{10}$

d. $\frac{7}{6}\times36$ $\frac{7}{6}\times36$

e. $24\times\frac{5}{8}$ $24\times\frac{5}{8}$

Lesson 8: Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.

125

f. $18 \times \frac{5}{12}$ $18 \times \frac{5}{12}$

g. $\frac{10}{9} \times 21$ $\frac{10}{9} \times 21$

3.   Solve each problem any way you choose.

   a. $\frac{1}{3} \times 60$ $\frac{1}{3}$ minute = _____ seconds

   b. $\frac{4}{5} \times 60$ $\frac{4}{5}$ hour = _____ minutes

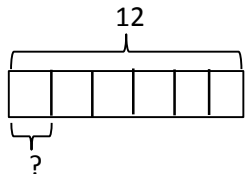   c. $\frac{7}{10} \times 1000$ $\frac{7}{10}$ kilogram = _____ grams

   d. $\frac{3}{5} \times 100$ $\frac{3}{5}$ meter = _____ centimeters

EUREKA MATH™

Lesson 8:   Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.

engage^{ny}

Name _____   Date _____

1. Convert. Show your work using a tape diagram or an equation. The first one is done for you.

<table>
<tr>
<td>

a. $\frac{1}{4}$ yard = ____9____ inches

$\frac{1}{4}$ yard = $\frac{1}{4}$ × 1 yard

$\quad = \frac{1}{4}$ × 36 inches

$\quad = \frac{36}{4}$ inches

$\quad$ = 9 inches

</td>
<td>

b. $\frac{1}{6}$ foot = _____ inches

$\frac{1}{6}$ foot = $\frac{1}{6}$ × 1 foot

$\quad = \frac{1}{6}$ × 12 inches

$\quad$ =

</td>
</tr>
<tr>
<td>

c. $\frac{3}{4}$ year = _____ months

</td>
<td>

d. $\frac{3}{5}$ meter = _____ centimeters

</td>
</tr>
<tr>
<td>

e. $\frac{5}{12}$ hour = _____ minutes

</td>
<td>

f. $\frac{2}{3}$ yard = _____ inches

</td>
</tr>
</table>

2. Michelle measured the length of her forearm. It was $\frac{3}{4}$ of a foot. How long is her forearm in inches?

Lesson 9:   Find a fraction of a measurement, and solve word problems.

136

EUREKA MATH™

engage^ny

Modified from original

3. At the market, Ms. Winn bought $\frac{3}{4}$ lb of grapes and $\frac{5}{8}$ lb of cherries.

    a. How many ounces of grapes did Ms. Winn buy?

    b. How many ounces of cherries did Ms. Winn buy?

    c. How many more ounces of grapes than cherries did Ms. Winn buy?

    d. If Mr. Phillips bought $1\frac{3}{4}$ pounds of raspberries, who bought more fruit, Ms. Winn or Mr. Phillips? How many ounces more?

4. A gardener has 10 pounds of soil. He used $\frac{5}{8}$ of the soil for his garden. How many pounds of soil did he use in the garden? How many pounds did he have left?

Lesson 9: Find a fraction of a measurement, and solve word problems.

137

Name _____   Date _____

1. Write expressions to match the diagrams. Then, evaluate.
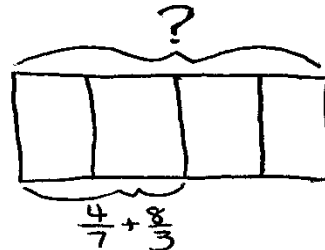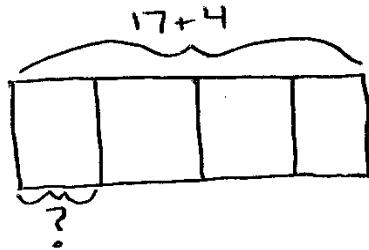
2. Circle the expression(s) that give the same product as $6 \times \frac{3}{8}$. Explain how you know.

$8 \div (3 \times 6)$ $3 \div 8 \times 6$ $(6 \times 3) \div 8$ $(8 \div 6) \times 3$ $6 \times \frac{8}{3}$ $\frac{3}{8} \times 6$

3. Write an expression to match, and then evaluate.

a. $\frac{1}{8}$ the sum of 23 and 17

b. Subtract 4 from $\frac{1}{6}$ of 42.
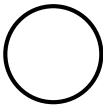
c. 7 times as much as the sum of $\frac{1}{3}$ and $\frac{4}{5}$
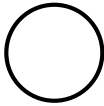
d. $\frac{2}{3}$ of the product of $\frac{3}{8}$ and 16
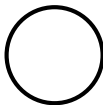
e. 7 copies of the sum of 8 fifths and 4

f. 15 times as much as 1 fifth of 12

4. Use <, >, or = to make true number sentences without calculating. Explain your thinking.

a. $\frac{2}{3} \times (9 + 12)$ ◯ $15 \times \frac{2}{3}$

b. $\left(3 \times \frac{5}{4}\right) \times \frac{3}{5}$ ◯ $\left(3 \times \frac{5}{4}\right) \times \frac{3}{8}$

b. $6 \times \left(2 + \frac{32}{16}\right)$ ◯ $(6 \times 2) + \frac{32}{16}$

5. Fantine bought flour for her bakery each month and recorded the amount in the table to the right. For (a)–(c), write an expression that records the calculation described. Then, solve to find the missing data in the table.

a. She bought $\frac{3}{4}$ of January's total in August.

b. She bought $\frac{7}{8}$ as much in April as she did in October and July combined.

Month	Amount (in pounds)
January	3
February	2
March	$1\frac{1}{4}$
April	
May	$\frac{9}{8}$
June	
July	$1\frac{1}{4}$
August	
September	$\frac{11}{4}$
October	$\frac{3}{4}$

Modified from original

c. In June, she bought $\frac{1}{8}$ pound less than three times as much as she bought in May.

d. Display the data from the table in a line plot.

e. How many pounds of flour did Fantine buy from January to October?
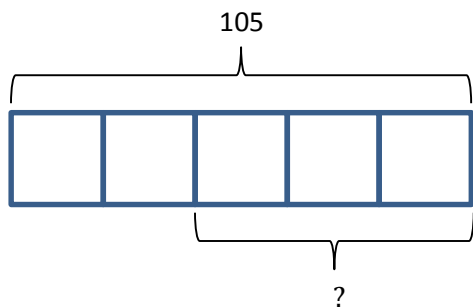
Name _____   Date _____

1. Jenny's mom says she has an hour before it's bedtime. Jenny spends $\frac{1}{3}$ of the hour texting a friend and $\frac{1}{4}$ of the time brushing her teeth and putting on her pajamas. She spends the rest of the time reading her book. How many minutes did Jenny read?

2. A-Plus Auto Body is painting designs on a customer's car. They had 18 pints of blue paint on hand. They used $\frac{1}{2}$ of it for the flames and $\frac{1}{3}$ of it for the sparks. They need $7\frac{3}{4}$ pints of blue paint to paint the next design. How many more pints of blue paint will they need to buy?

3. Giovanna, Frances, and their dad each carried a 10-pound bag of soil into the backyard. After putting soil in the first flower bed, Giovanna's bag was $\frac{5}{8}$ full, Frances's bag was $\frac{2}{5}$ full, and their dad's was $\frac{3}{4}$ full. How many pounds of soil did they put in the first flower bed altogether?

EUREKA MATH™   **Lesson 11:** Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^ny   **167**

4. Mr. Chan made 252 cookies for the Annual Fifth Grade Class Bake Sale. They sold $\frac{3}{4}$ of them, and $\frac{3}{9}$ of the remaining cookies were given to PTA. members. Mr. Chan allowed the 12 student helpers to divide the cookies that were left equally. How many cookies will each student get?

5. Using the tape diagram below, create a story problem about a farm. Your story must include a fraction.

105

?

EUREKA MATH™

Lesson 11:   Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^{ny}

168

Modified from original

Name _____   Date _____

1. Terrence finished a word search in $\frac{3}{4}$ the time it took Frank. Charlotte finished the word search in $\frac{2}{3}$ the time it took Terrence. Frank finished the word search in 32 minutes. How long did it take Charlotte to finish the word search?

2. Ms. Phillips ordered 56 pizzas for a school fundraiser. Of the pizzas ordered, $\frac{2}{7}$ of them were pepperoni, 19 were cheese, and the rest were veggie pizzas. What fraction of the pizzas was veggie?

EUREKA MATH

Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^ny   183

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

3. In an auditorium, $\frac{1}{6}$ of the students are fifth graders, $\frac{1}{3}$ are fourth graders, and $\frac{1}{4}$ of the remaining students are second graders. If there are 96 students in the auditorium, how many second graders are there?

4. At a track meet, Jacob and Daniel compete in the 220 m hurdles. Daniel finishes in $\frac{3}{4}$ of a minute. Jacob finishes with $\frac{5}{12}$ of a minute remaining. Who ran the race in the faster time?

    Bonus: Express the difference in their times as a fraction of a minute.

EUREKA MATH™

Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^{ny}

184

5. Create and solve a story problem about a runner who is training for a race. Include at least one fraction in your story.

48 km

?
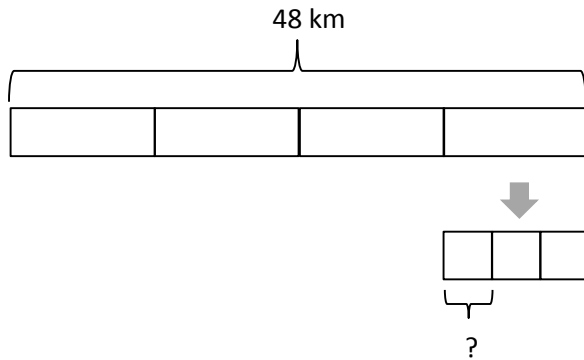
6. Create and solve a story problem about two friends and their weekly allowance whose solution is given by the expression $\frac{1}{5} \times (12 + 8)$.

EUREKA MATH

Lesson 12: Solve and create fraction word problems involving addition, subtraction, and multiplication.

engage^{ny}

185

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

Name _____   Date _____

1. Solve. Draw a rectangular fraction model to show your thinking.

    a. Half of $\frac{1}{2}$ cake = _____ cake.

    b. One-third of $\frac{1}{2}$ cake = _____ cake.

    c. $\frac{1}{4}$ of $\frac{1}{2}$

    d. $\frac{1}{2} \times \frac{1}{5}$

    e. $\frac{1}{3} \times \frac{1}{3}$

    f. $\frac{1}{4} \times \frac{1}{3}$

2. Noah mows $\frac{1}{2}$ of his property and leaves the rest wild. He decides to use $\frac{1}{5}$ of the wild area for a vegetable garden. What fraction of the property is used for the garden? Draw a picture to support your answer.

3. Fawn plants $\frac{2}{3}$ of the garden with vegetables. Her son plants the remainder of the garden. He decides to use $\frac{1}{2}$ of his space to plant flowers, and in the rest, he plants herbs. What fraction of the entire garden is planted in flowers? Draw a picture to support your answer.

4. Diego eats $\frac{1}{5}$ of a loaf of bread each day. On Tuesday, Diego eats $\frac{1}{4}$ of the day's portion before lunch. What fraction of the whole loaf does Diego eat before lunch on Tuesday? Draw a rectangular fraction model to support your thinking.

Name _____   Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking.

   a. $\frac{1}{2}$ of $\frac{2}{3}$ = $\frac{1}{2}$ of _____ third(s) = _____ third(s)   b. $\frac{1}{2}$ of $\frac{4}{3}$ = $\frac{1}{2}$ of _____ third(s) = _____ third(s)

   c. $\frac{1}{3}$ of $\frac{3}{5}$ =   d. $\frac{1}{2}$ of $\frac{6}{8}$ =

   e. $\frac{1}{3} \times \frac{4}{5}$ =   f. $\frac{4}{5} \times \frac{1}{3}$ =

2. Sarah has a photography blog. $\frac{3}{7}$ of her photos are of nature. $\frac{1}{4}$ of the rest are of her friends. What fraction of all of Sarah's photos is of her friends? Support your answer with a model.

EUREKA
MATH™

Modified from original

3. At Laurita's Bakery, $\frac{3}{5}$ of the baked goods are pies, and the rest are cakes. $\frac{1}{3}$ of the pies are coconut. $\frac{1}{6}$ of the cakes are angel food.

    a. What fraction of all of the baked goods at Laurita's Bakery are coconut pies?

    b. What fraction of all of the baked goods at Laurita's Bakery are angel food cakes?

4. Grandpa Mick opened a pint of ice cream. He gave his youngest grandchild $\frac{1}{5}$ of the ice cream and his middle grandchild $\frac{1}{4}$ of the remaining ice cream. Then, he gave his oldest grandchild $\frac{1}{3}$ of the ice cream that was left after serving the others.

    a. Who got the most ice cream? How do you know? Draw a picture to support your reasoning.

    b. What fraction of the pint of ice cream will be left if Grandpa Mick serves himself the same amount as the second grandchild?

Lesson 14:   Multiply unit fractions by non-unit fractions.

EUREKA MATH™

engage^{ny}

227

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Name _____   Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence.

   a. $\frac{2}{3}$ of $\frac{3}{4} =$

   b. $\frac{2}{5}$ of $\frac{3}{4} =$

   c. $\frac{2}{5}$ of $\frac{4}{5} =$

   d. $\frac{4}{5}$ of $\frac{3}{4} =$

2. Multiply. Draw a rectangular fraction model if it helps you.

   a. $\frac{5}{6} \times \frac{3}{10}$

   b. $\frac{3}{4} \times \frac{4}{5}$

   c. $\frac{5}{6} \times \frac{5}{8}$

   d. $\frac{3}{4} \times \frac{5}{12}$

   e. $\frac{8}{9} \times \frac{2}{3}$

   f. $\frac{3}{7} \times \frac{2}{9}$

3. Every morning, Halle goes to school with a 1-liter bottle of water. She drinks $\frac{1}{4}$ of the bottle before school starts and $\frac{2}{3}$ of the rest before lunch.

    a. What fraction of the bottle does Halle drink after school starts but before lunch?

    b. How many milliliters are left in the bottle at lunch?

4. Moussa delivered $\frac{3}{8}$ of the newspapers on his route in the first hour and $\frac{4}{5}$ of the rest in the second hour. What fraction of the newspapers did Moussa deliver in the second hour?

5. Rose bought some spinach. She used $\frac{3}{5}$ of the spinach on a pan of spinach pie for a party and $\frac{3}{4}$ of the remaining spinach for a pan for her family. She used the rest of the spinach to make a salad.

    a. What fraction of the spinach did she use to make the salad?

    b. If Rose used 3 pounds of spinach to make the pan of spinach pie for the party, how many pounds of spinach did Rose use to make the salad?

EUREKA MATH™

Modified from original

Name _____   Date _____

Solve and show your thinking with a tape diagram.

1. Anthony bought an 8-foot board. He cut off $\frac{3}{4}$ of the board to build a shelf and gave $\frac{1}{3}$ of the rest to his brother for an art project. How many inches long was the piece Anthony gave to his brother?

2. Riverside Elementary School is holding a school-wide election to choose a school color. Five-eighths of the votes were for blue, $\frac{5}{9}$ of the remaining votes were for green, and the remaining 48 votes were for red.

   a. How many votes were for blue?

   b. How many votes were for green?

EUREKA MATH

Lesson 16: Solve word problems using tape diagrams and fraction-by-fraction multiplication.

engage^ny   255

c. If every student got one vote, but there were 25 students absent on the day of the vote, how many students are there at Riverside Elementary School?

d. Seven-tenths of the votes for blue were made by girls. Did girls who voted for blue make up more than or less than half of all votes? Support your reasoning with a picture.

e. How many girls voted for blue?

Modified from original

Name _____ Date _____

1. Multiply and model. Rewrite each expression as a number sentence with decimal factors. The first one is done for you.

a. $\frac{1}{10} \times \frac{1}{10}$

$$= \frac{1 \times 1}{10 \times 10}$$

$$= \frac{1}{100}$$
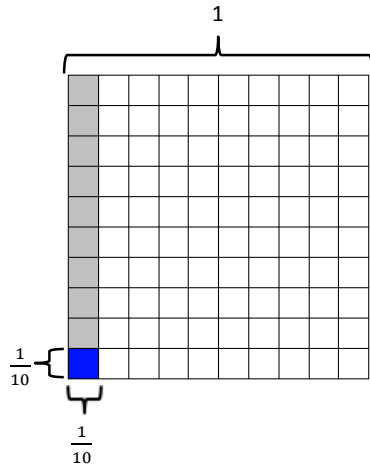
0.1 × 0.1 = 0.01

b. $\frac{6}{10} \times \frac{2}{10}$

c. $\frac{1}{10} \times 1.6$

d. $\frac{6}{10} \times 1.9$

EUREKA MATH™

engage^{ny}
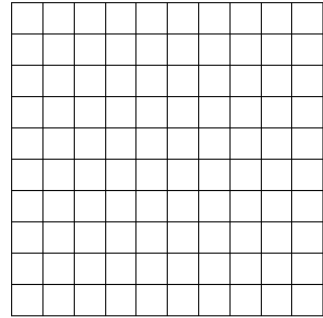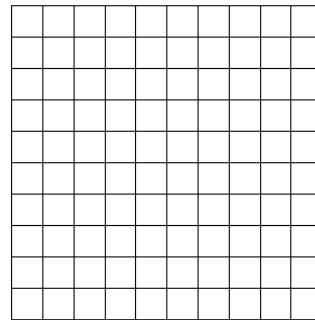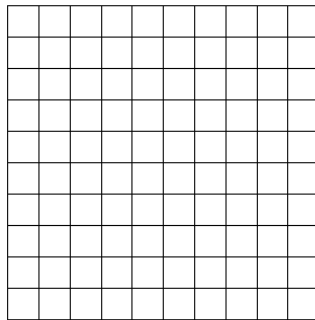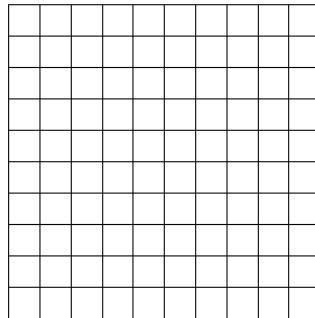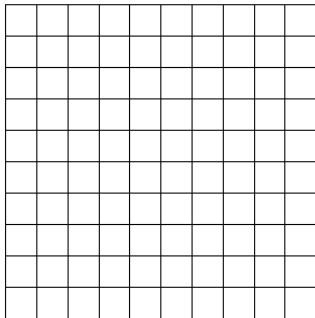
2. Multiply. The first few are started for you.

a. $4 \times 0.6 =$ _____

$$= 4 \times \frac{6}{10}$$

$$= \frac{4 \times 6}{10}$$

$$= \frac{24}{10}$$

$$= 2.4$$

b. $0.4 \times 0.6 =$ _____

$$= \frac{4}{10} \times \frac{6}{10}$$

$$= \frac{4 \times 6}{10 \times 10}$$

$$=$$

c. $0.04 \times 0.6 =$ _____

$$= \frac{4}{100} \times \frac{6}{10}$$

$$= \frac{\underline{\ } \times \underline{\ }}{100 \times 10}$$

$$=$$

d. $7 \times 0.3 =$ _____

e. $0.7 \times 0.3 =$ _____

f. $0.07 \times 0.3 =$ _____

g. $1.3 \times 5 =$ _____

h. $1.3 \times 0.5 =$ _____

i. $0.13 \times 0.5 =$ _____

3. Jennifer makes 1.7 liters of lemonade. If she pours 3 tenths of the lemonade in the glass, how many liters of lemonade are in the glass?

4. Cassius walked 6 tenths of a 3.6-mile trail.

a. How many miles did Cassius have left to hike?

b. Cameron was 1.3 miles ahead of Cassius. How many miles did Cameron hike already?

Name _____   Date _____

1. Multiply using fraction form and unit form. Check your answer by counting the decimal places.
    The first one is done for you.

    a. $3.3 \times 1.6 = \frac{33}{10} \times \frac{16}{10}$

         $= \frac{33 \times 16}{100}$

         $= \frac{528}{100}$

         $= 5.28$

             3 3 tenths
         $\times$ 1 6 tenths
            1 9 8
         $+$ 3 3 0
            5 2 8 hundredths

    b. $3.3 \times 0.8 =$

            3 3 tenths
        $\times$ 8 tenths

    c. $4.4 \times 3.2 =$

    d. $2.2 \times 1.6 =$

2. Multiply using fraction form and unit form. The first one is partially done for you.

    a. $3.36 \times 1.4 = \frac{336}{100} \times \frac{14}{10}$

         $= \frac{336 \times 14}{1,000}$

         $= \frac{4,704}{1,000}$

         $= 4.704$

            3 3 6 hundredths
         $\times$ 1 4 tenths

    b. $3.35 \times 0.7 =$

           3 3 5 hundredths
        $\times$ 7 tenths

    c. $4.04 \times 3.2 =$

    d. $4.4 \times 0.16 =$

EUREKA MATH™

engage^{ny}

3. Solve using the standard algorithm. Show your thinking about the units of your product. The first one is done for you.

a. $3.2 \times 0.6 = 1.92$

$$\frac{32}{10} \times \frac{6}{10} = \frac{32 \times 6}{100}$$

   3 2 tenths
×   6 tenths
 1 9 2 hundredths

b. $2.3 \times 2.1 = $ _____

   2 3 tenths
×   2 1 tenths

c. $7.41 \times 3.4 = $ _____

d. $6.50 \times 4.5 = $ _____

4. Erik buys 2.5 pounds of cashews. If each pound of cashews costs $7.70, how much will he pay for the cashews?

5. A swimming pool at a park measures 9.75 meters by 7.2 meters.

a. Find the area of the swimming pool.

b. The area of the playground is one and a half times that of the swimming pool. Find the total area of the swimming pool and the playground.

Name _____   Date _____

1. Convert. Express your answer as a mixed number, if possible.

a. 2 ft = _____$\frac{2}{3}$_____ yd
 	
2 ft = 2 × 1 ft
 	
    = 2 × $\frac{1}{3}$ yd
 	
    = $\frac{2}{3}$ yd
	b. 6 ft = _____ yd
	
	6 ft = 6 × 1 ft
	
	    = 6 × _____ yd
	
	    = _____ yd

c. 5 in = _____ ft	d. 14 in = _____ ft
e. 7 oz = _____ lb	f. 20 oz = _____ lb
g. 1 pt = _____ qt	h. 4 pt = _____ qt

Lesson 19: Convert measures involving whole numbers, and solve multi-step word problems.

Modified from original

2. Marty buys 12 ounces of granola.

    a. What fraction of a pound of granola did Marty buy?

    b. If a whole pound of granola costs $4, how much did Marty pay?

3. Sara and her dad visit Yo-Yo Yogurt again. This time, the scale says that Sara has 14 ounces of vanilla yogurt in her cup. Her father's yogurt weighs half as much. How many pounds of frozen yogurt did they buy altogether on this visit? Express your answer as a mixed number.

4. An art teacher uses 1 quart of blue paint each month. In one year, how many gallons of paint will she use?

Lesson 19:   Convert measures involving whole numbers, and solve multi-step
              word problems.

engage^{ny}   297

Modified from original

Name _____ Date _____

1. Convert. Show your work. Express your answer as a mixed number. The first one is done for you.

a. $2\frac{2}{3}$ yd = __8__ ft $2\frac{2}{3}$ yd $= 2\frac{2}{3} \times 1$ yd $\quad = 2\frac{2}{3} \times 3$ ft $\quad = \frac{8}{3} \times 3$ ft $\quad = \frac{24}{3}$ ft $\quad = 8$ ft	b. $1\frac{1}{4}$ ft = _____ yd $1\frac{1}{4}$ ft $= 1\frac{1}{4} \times 1$ ft $\quad = 1\frac{1}{4} \times \frac{1}{3}$ yd $\quad = \frac{5}{4} \times \frac{1}{3}$ yd $\quad =$
c. $3\frac{5}{6}$ ft = _____ in	d. $7\frac{1}{2}$ pt = _____ qt
e. $4\frac{3}{10}$ hr = _____ min	f. 33 months = _____ years

EUREKA MATH

Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.

engage^ny

309

© 2015 Great Minds. eureka-math.org
 G5-M4-TE-1.3.0-06.2015

Modified from original
 (cc) BY-NC-SA This work is licensed under a
 Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

2. Four members of a track team run a relay race in 165 seconds. How many minutes did it take them to run the race?

3. Horace buys $2\frac{3}{4}$ pounds of blueberries for a pie. He needs 48 ounces of blueberries for the pie. How many more pounds of blueberries does he need to buy?

4. Tiffany is sending a package that may not exceed 16 pounds. The package contains books that weigh a total of $9\frac{3}{8}$ pounds. The other items to be sent weigh $\frac{3}{5}$ the weight of the books. Will Tiffany be able to send the package?

EUREKA MATH™

Lesson 20: Convert mixed unit measurements, and solve multi-step word problems.

engage^{ny}

310

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

Modified from original

Name _____   Date _____

1. Fill in the blanks.

   a. $\frac{1}{3} \times 1 = \frac{1}{3} \times \frac{3}{3} = \frac{}{9}$

   b. $\frac{2}{3} \times 1 = \frac{2}{3} \times \frac{}{} = \frac{14}{21}$

   c. $\frac{5}{2} \times 1 = \frac{5}{2} \times \frac{}{} = \frac{25}{}$

   d. Compare the first factor to the value of the product.

2. Express each fraction as an equivalent decimal. The first one is partially done for you.

   a. $\frac{3}{4} \times \frac{25}{25} = \frac{3 \times 25}{4 \times 25} = \frac{}{100} =$

   b. $\frac{1}{4} \times \frac{25}{25} =$

   c. $\frac{2}{5} \times \frac{}{} =$

   d. $\frac{3}{5} \times \frac{}{} =$

   e. $\frac{3}{20}$

   f. $\frac{25}{20}$

EUREKA MATH™

Lesson 21:   Explain the size of the product, and relate fraction and decimal equivalence to multiplying a fraction by 1.

engage^ny   **325**

Modified from original

g. $\frac{23}{25}$

h. $\frac{89}{50}$

i. $3\frac{11}{25}$

j. $5\frac{41}{50}$

3. $\frac{6}{8}$ is equivalent to $\frac{3}{4}$. How can you use this to help you write $\frac{6}{8}$ as a decimal? Show your thinking to solve.

4. A number multiplied by a fraction is not always smaller than the original number. Explain this and give at least two examples to support your thinking.

5. Elise has $\frac{3}{4}$ of a dollar. She buys a stamp that costs 44 cents. Change both numbers into decimals, and tell how much money Elise has after paying for the stamp.

EUREKA MATH

Lesson 21: Explain the size of the product, and relate fraction and decimal equivalence to multiplying a fraction by 1.

engage^{ny}

326

Modified from original

Name _____   Date _____

1. Solve for the unknown. Rewrite each phrase as a multiplication sentence. Circle the scaling factor and put a box around the number of meters.

   a. $\frac{1}{3}$ as long as 6 meters = _____ meter(s)   b. 6 times as long as $\frac{1}{3}$ meter = _____ meter(s)

2. Draw a tape diagram to model each situation in Problem 1, and describe what happened to the number of meters when it was multiplied by the scaling factor.

   a.   b.

3. Fill in the blank with a numerator or denominator to make the number sentence true.

   a. $5 \times \dfrac{}{3} > 5$ b. $\dfrac{6}{} \times 12 < 12$ c. $4 \times \dfrac{}{5} = 4$

4. Look at the inequalities in each box. Choose a single fraction to write in all three blanks that would make all three number sentences true. Explain how you know.

   a.
$\frac{2}{3} \times$ _____ $> \frac{2}{3}$	$4 \times$ _____ > 4	$\frac{5}{3} \times$ _____ $> \frac{5}{3}$

   b.
$\frac{2}{3} \times$ _____ $< \frac{2}{3}$	$4 \times$ _____ < 4	$\frac{5}{3} \times$ _____ $< \frac{5}{3}$

Lesson 22:   Compare the size of the product to the size of the factors.

EUREKA MATH™

engage^{ny}

5. Write a number in the blank that will make the number sentence true.

    a. $3 \times$ _____ < 1

    b.   Explain how multiplying by a whole number can result in a product less than 1.

6. In a sketch, a fountain is drawn $\frac{1}{4}$ yard tall. The actual fountain will be 68 times as tall. How tall will the fountain be?

7. In blueprints, an architect's firm drew everything $\frac{1}{24}$ of the actual size. The windows will actually measure 4 ft by 6 ft and doors measure 12 ft by 8 ft. What are the dimensions of the windows and the doors in the drawing?

EUREKA MATH™

Lesson 22:   Compare the size of the product to the size of the factors.

engageny

340

Name _____   Date _____

1.

a. Sort the following expressions by rewriting them in the table.

The product is less than the boxed number:	The product is greater than the boxed number:

12.5 × 1.989   828 × 0.921   321.46 × 1.26

0.007 × 1.02   2.16 × 1.11   0.05 × 0.1

b. What do the expressions in each column have in common?

2. Write a statement using one of the following phrases to compare the value of the expressions. Then, explain how you know.

  is slightly more than   *is a lot more than*   *is slightly less than*   *is a lot less than*

a. 14 × 0.999   _____   14

b. 1.01 × 2.06   _____   2.06

c. 1,955 × 0.019   _____   1,955

EUREKA MATH™

engage^{ny}

Modified from original

d. Two thousand × 1.0001   _____   two thousand

e. Two-thousandths × 0.911   _____   two-thousandths

3. Rachel is 1.5 times as heavy as her cousin, Kayla. Another cousin, Jonathan, weighs 1.25 times as much as Kayla. List the cousins, from lightest to heaviest, and explain your thinking.

4. Circle your choice.

   a. $a \times b > a$
      For this statement to be true, b must be   **greater than 1**   **less than 1**

      Write two expressions that support your answer. Be sure to include one decimal example.

   b. $a \times b < a$
      For this statement to be true, b must be   **greater than 1**   **less than 1**

      Write two expressions that support your answer. Be sure to include one decimal example.

Modified from original

Name _____   Date _____

1. Jesse takes his dog and cat for their annual vet visit. Jesse's dog weighs 23 pounds. The vet tells him his cat's weight is $\frac{5}{8}$ as much as his dog's weight. How much does his cat weigh?

2. An image of a snowflake is 1.8 centimeters wide. If the actual snowflake is $\frac{1}{8}$ the size of the image, what is the width of the actual snowflake? Express your answer as a decimal.

EUREKA MATH™

Lesson 24:   Solve word problems using fraction and decimal multiplication.

engage^{ny}

366

3. A community bike ride offers a short 5.7-mile ride for children and families. The short ride is followed by a long ride, $5\frac{2}{3}$ times as long as the short ride, for adults. If a woman bikes the short ride with her children and then the long ride with her friends, how many miles does she ride altogether?

4. Sal bought a house for $78,524.60. Twelve years later he sold the house for $2\frac{3}{4}$ times as much. What was the sale price of the house?

Lesson 24: Solve word problems using fraction and decimal multiplication.

EUREKA MATH™

engage^ny 367

© 2015 Great Minds. eureka-math.org
G5-M4-TE-1.3.0-06.2015

5. In the fifth grade at Lenape Elementary School, there are $\frac{4}{5}$ as many students who do not wear glasses as those who do wear glasses. If there are 60 students who wear glasses, how many students are in the fifth grade?

6. At a factory, a mechanic earns $17.25 an hour. The president of the company earns $6\frac{2}{3}$ times as much for each hour he works. The janitor at the same company earns $\frac{3}{5}$ as much as the mechanic. How much does the company pay for all three employees' wages for one hour of work?

Lesson 24: Solve word problems using fraction and decimal multiplication.

368

Name _____   Date _____

1. Draw a tape diagram and a number line to solve. Fill in the blanks that follow.

a. $3 \div \frac{1}{3} =$ _____

There are ____ thirds in 1 whole.

There are ____ thirds in 3 wholes.

If 3 is $\frac{1}{3}$, what is the whole? _____

b. $3 \div \frac{1}{4} =$ _____

There are ____ fourths in 1 whole.

There are ____ fourths in __ wholes.

If 3 is $\frac{1}{4}$, what is the whole? _____

c. $4 \div \frac{1}{3} =$ _____

There are ____ thirds in 1 whole.

There are ____ thirds in __ wholes.

If 4 is $\frac{1}{3}$, what is the whole? _____

d. $5 \div \frac{1}{4} =$ _____

There are ____ fourths in 1 whole.

There are ____ fourths in __ wholes.

If 5 is $\frac{1}{4}$, what is the whole? _____

2. Divide. Then, multiply to check.

a. $2 \div \frac{1}{4}$	b. $6 \div \frac{1}{2}$	c. $5 \div \frac{1}{4}$	d. $5 \div \frac{1}{8}$
e. $6 \div \frac{1}{3}$	f. $3 \div \frac{1}{6}$	g. $6 \div \frac{1}{5}$	h. $6 \div \frac{1}{10}$

3. A principal orders 8 sub sandwiches for a teachers' meeting. She cuts the subs into thirds and puts the mini-subs onto a tray. How many mini-subs are on the tray?

4. Some students prepare 3 different snacks. They make $\frac{1}{8}$ pound bags of nut mix, $\frac{1}{4}$ pound bags of cherries, and $\frac{1}{6}$ pound bags of dried fruit. If they buy 3 pounds of nut mix, 5 pounds of cherries, and 4 pounds of dried fruit, how many of each type of snack bag will they be able to make?

Name _____   Date _____

1. Solve and support your answer with a model or tape diagram. Write your quotient in the blank.

    a. $\frac{1}{2} \div 4 =$ _____   b. $\frac{1}{3} \div 6 =$ _____

    c. $\frac{1}{4} \div 3 =$ _____   d. $\frac{1}{5} \div 2 =$ _____

2. Divide. Then, multiply to check.

a. $\frac{1}{2} \div 10$	b. $\frac{1}{4} \div 10$	c. $\frac{1}{3} \div 5$	d. $\frac{1}{5} \div 3$
e. $\frac{1}{8} \div 4$	f. $\frac{1}{7} \div 3$	g. $\frac{1}{10} \div 5$	h. $\frac{1}{5} \div 20$

3. Teams of four are competing in a quarter-mile relay race. Each runner must run the same exact distance. What is the distance each teammate runs?

4. Solomon has read $\frac{1}{3}$ of his book. He finishes the book by reading the same amount each night for 5 nights.

    a. What fraction of the book does he read each of the 5 nights?

    b. If he reads 14 pages on each of the 5 nights, how long is the book?

Name _____   Date _____

1. Kelvin ordered four pizzas for a birthday party. The pizzas were cut in eighths. How many slices were there? Draw a picture to support your response.

2. Virgil has $\frac{1}{6}$ of a birthday cake left over. He wants to share the leftover cake with 3 friends. What fraction of the original cake will each of the 4 people receive? Draw a picture to support your response.

3. A pitcher of water contains $\frac{1}{4}$ liters of water. The water is poured equally into 5 glasses.

    a. How many liters of water are in each glass? Draw a picture to support your response.

engage^ny   418

Modified from original

b. Write the amount of water in each glass in milliliters.

4. Drew has 4 pieces of rope 1 meter long each. He cuts each rope into fifths.

a. How many fifths will he have after cutting all the ropes?

b. How long will each of the fifths be in centimeters?

5. A container is filled with blueberries. $\frac{1}{6}$ of the blueberries is poured equally into two bowls.

    a. What fraction of the blueberries is in each bowl?

    b. If each bowl has 6 ounces of blueberries in it, how many ounces of blueberries were in the full container?

    c. If $\frac{1}{5}$ of the remaining blueberries is used to make muffins, how many pounds of blueberries are left in the container?

Name _____   Date _____

1. Divide. Rewrite each expression as a division sentence with a fraction divisor, and fill in the blanks. The first one is done for you.

Example: $4 ÷ 0.1 = 4 ÷ \frac{1}{10} = 40$

There are __10__ tenths in 1 whole.

There are __40__ tenths in 4 wholes.

a. $9 ÷ 0.1$

There are _____ tenths in 1 whole.

There are _____ tenths in 9 wholes.

b. $6 ÷ 0.1$

There are _____ tenths in 1 whole.

There are _____ tenths in 6 wholes.

c. $3.6 ÷ 0.1$

There are _____ tenths in 3 wholes.

There are _____ tenths in 6 tenths.

There are _____ tenths in 3.6.

d. $12.8 ÷ 0.1$

There are _____ tenths in 12 wholes.

There are _____ tenths in 8 tenths.

There are _____ tenths in 12.8.

e. $3 ÷ 0.01$

There are _____ hundredths in 1 whole.

There are _____ hundredths in 3 wholes.

f. $7 ÷ 0.01$

There are _____ hundredths in 1 whole.

There are _____ hundredths in 7 wholes.

g. $4.7 ÷ 0.01$

There are _____ hundredths in 4 wholes.

There are _____ hundredths in 7 tenths.

There are _____ hundredths in 4.7.

h. $11.3 ÷ 0.01$

There are _____ hundredths in 11 wholes.

There are _____ hundredths in 3 tenths.

There are _____ hundredths in 11.3.

EUREKA MATH™

Lesson 29:   Connect division by a unit fraction to division by 1 tenth and 1 hundredth.

engage^ny

443

2. Divide.

a. 2 ÷ 0.1	b. 23 ÷ 0.1	c. 5 ÷ 0.01
d. 7.2 ÷ 0.1	e. 51 ÷ 0.01	f. 31 ÷ 0.1
g. 231 ÷ 0.1	h. 4.37 ÷ 0.01	i. 24.5 ÷ 0.01

3. Giovanna is charged $0.01 for each text message she sends. Last month, her cell phone bill included a $12.60 charge for text messages. How many text messages did Giovanna send?

4. Geraldine solved a problem: 68.5 ÷ 0.01 = 6,850.

   Ralph said, "This is wrong because a quotient can't be greater than the whole you start with. For example, 8 ÷ 2 = 4 and 250 ÷ 5 = 50." Who is correct? Explain your thinking.

5. The price for an ounce of gold on September 23, 2013, was $1,326.40. A group of 10 friends decide to equally share the cost of 1 ounce of gold. How much money will each friend pay?

EUREKA MATH™

Lesson 29:   Connect division by a unit fraction to division by 1 tenth and 1 hundredth.

engage^ny   444

Name _____   Date _____

1.   Rewrite the division expression as a fraction and divide. The first two have been started for you.

a. $2.4 \div 0.8 = \dfrac{2.4}{0.8}$ $= \dfrac{2.4 \times 10}{0.8 \times 10}$ $= \dfrac{24}{8}$ $=$	b. $2.4 \div 0.08 = \dfrac{2.4}{0.08}$ $= \dfrac{2.4 \times 100}{0.08 \times 100}$ $= \dfrac{240}{8}$ $=$
c. $4.8 \div 0.6$	d. $0.48 \div 0.06$
e. $8.4 \div 0.7$	f. $0.84 \div 0.07$

Lesson 30:   Divide decimal dividends by non-unit decimal divisors.

EUREKA MATH   engage^ny   459

g. 4.5 ÷ 1.5	h. 0.45 ÷ 0.15
i. 14.4 ÷ 1.2	j. 1.44 ÷ 0.12

2. Leann says 18 ÷ 6 = 3, so 1.8 ÷ 0.6 = 0.3 and 0.18 ÷ 0.06 = 0.03. Is Leann correct? Explain how to solve these division problems.

3. Denise is making bean bags. She has 6.4 pounds of beans.

    a. If she makes each bean bag 0.8 pounds, how many bean bags will she be able to make?

    b. If she decides instead to make mini bean bags that are half as heavy, how many can she make?

4. A restaurant's small salt shakers contain 0.6 ounces of salt. Its large shakers hold twice as much. The shakers are filled from a container that has 18.6 ounces of salt. If 8 large shakers are filled, how many small shakers can be filled with the remaining salt?

Lesson 30:   Divide decimal dividends by non-unit decimal divisors.

EUREKA MATH

engage^{ny}   461

Mission 6: The Coordinate Plane

Section One: Student Notes and Exit Tickets
To complete with all digital lessons

Are you ready to ⇒ZEARN?

The Coordinate Plane

Name:_____

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1. Use number line l to answer the questions.

D

2          $1\frac{3}{5}$
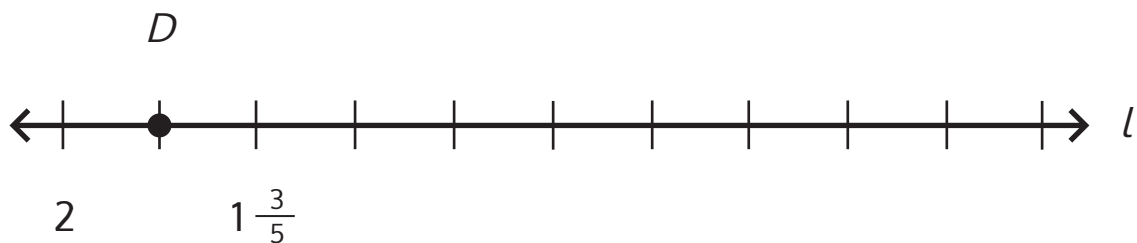
a. Plot point C so that its distance from the origin is 1.

b. Plot point E $\frac{4}{5}$ closer to the origin than C. What is its coordinate? _____

c. Plot a point at the midpoint of C and E. Label it H.

Lesson 2 G:5 M:6	Coordinate Pairs
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

You will need a ruler or straight edge for this lesson.

1 We'll plot point *A* and set up the coordinate plane. Then we'll plot point *B*.

_____

x-coordinate	*y*-coordinate
_____	_____

x _____
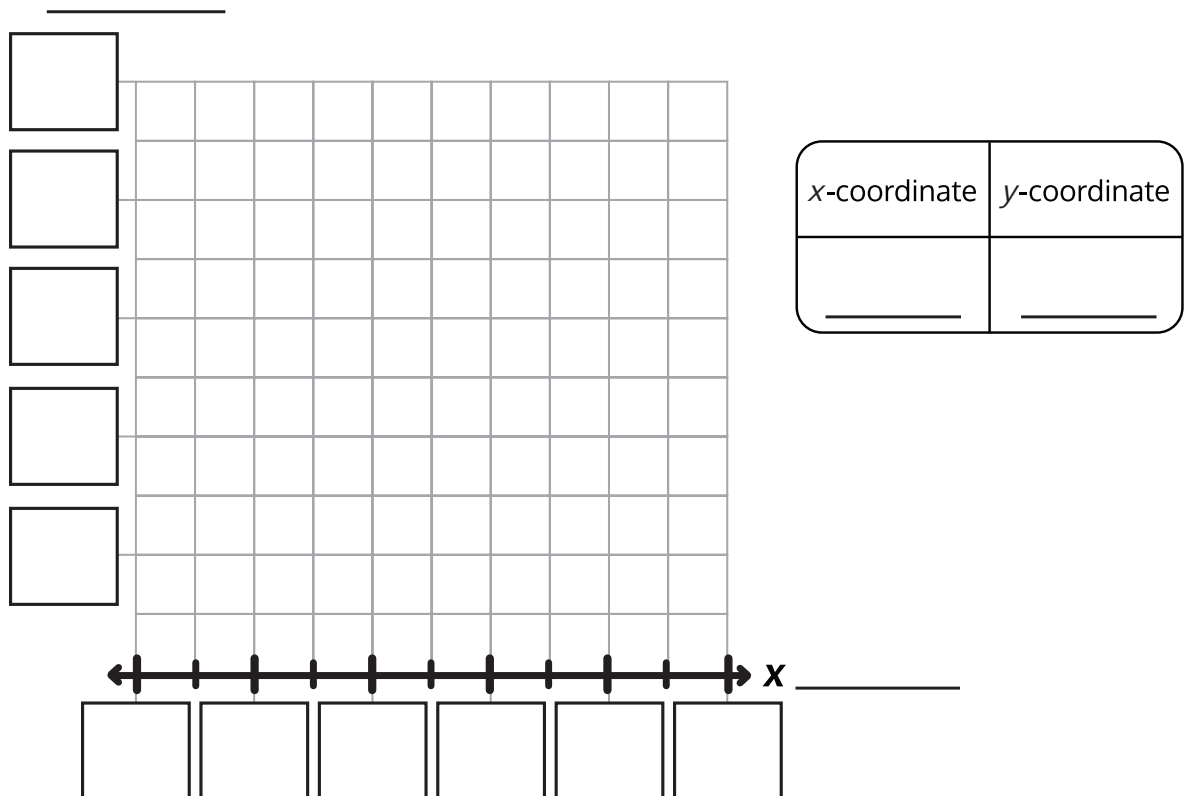
2 Plot point *C* at (3, 4), in the above coordinate plane.

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Name the coordinates of the shapes below.

Shape	x-coordinate	y-coordinate
Star		
Arrow		
Heart		
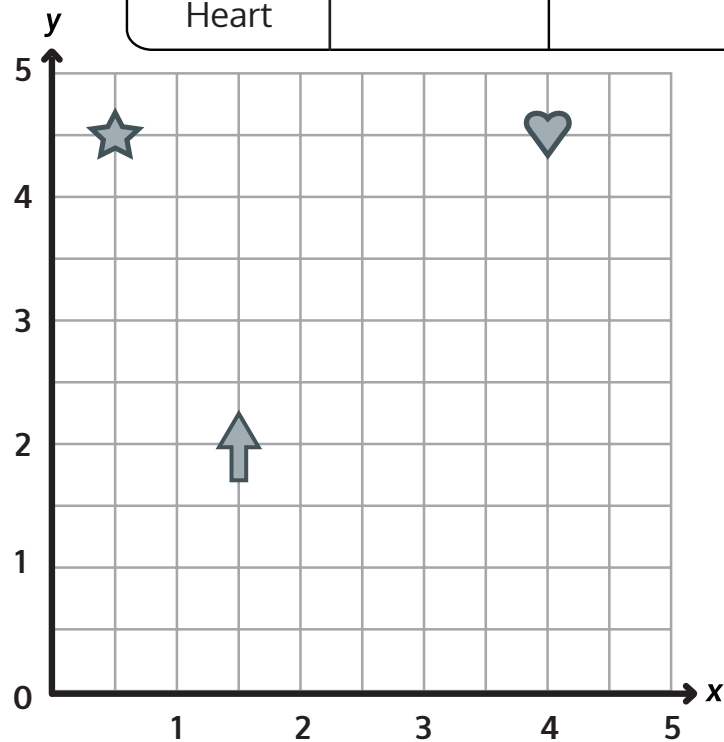
2. Plot a square at (3 , $3\frac{1}{2}$).

3. Plot a triangle at ($4\frac{1}{2}$, 1).

Lesson 3	Star Coordinates
G:5 M:6	**ZEARN STUDENT NOTES**

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

You will need a ruler or straight edge for this lesson.

1 Set up the coordinate plane. Write the coordinate pairs for points *A*, *B*, *C*, and *D*.

(_____ , _____)

(_____ , _____)

(_____ , _____)

(_____ , _____)
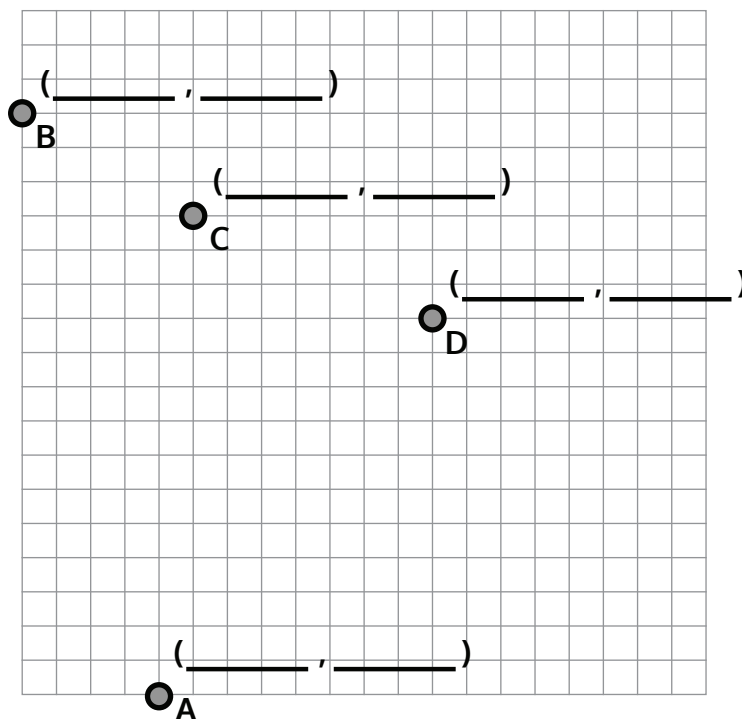
2 Plot point *E* at $(4, 2\frac{3}{4})$ in the above coordinate plane.

Name:_____ Date:_____

Complete: ☐   Class:_____

1. Use a ruler on the grid below to construct the axes for a coordinate plane. The *x*-axis should intersect points *L* and *M*. Construct the *y*-axis so that it contains points *K* and *L*. Label each axis.
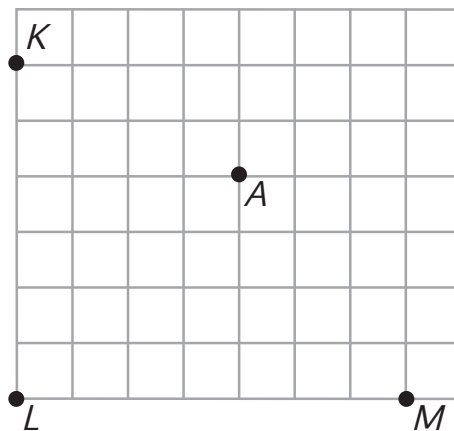
a. Place a hash mark on each grid line on the *x*- and *y*-axis.

b. Label each hash mark so that *A* is located at (1 , 1).

c. Plot the following points:

Point	*x*-coordinate	*y*-coordinate
B	$\frac{1}{4}$	0
C	$1\frac{1}{4}$	$\frac{3}{4}$

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____
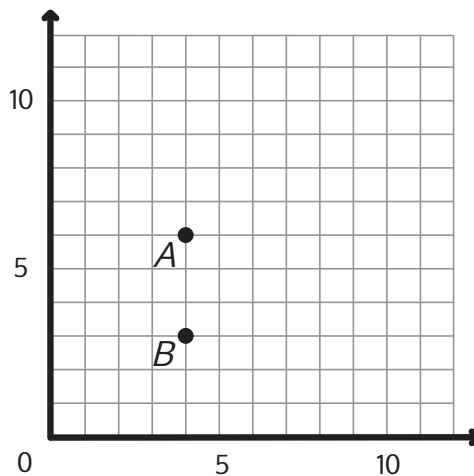
1. Use a straight edge to construct a line that goes through points *A* and *B*. Label the line *l*.

2. Which axis is parallel to line *l*? _____

    Which axis is perpendicular to line *l*? _____

3. Plot two more points on line *l*. Name them *C* and *D*.

4. Give the coordinates of each point below

    A : _____   *B* : _____

    C : _____   *D* : _____

5. Give the coordinates of another point that falls on line *l* with a

    y-coordinate greater than 20. _____

Name:_____ Date:_____

Complete: ☐   Class:_____

You will need a ruler or straight edge for this lesson.

1 Plot and label points and lines on the coordinate plane.
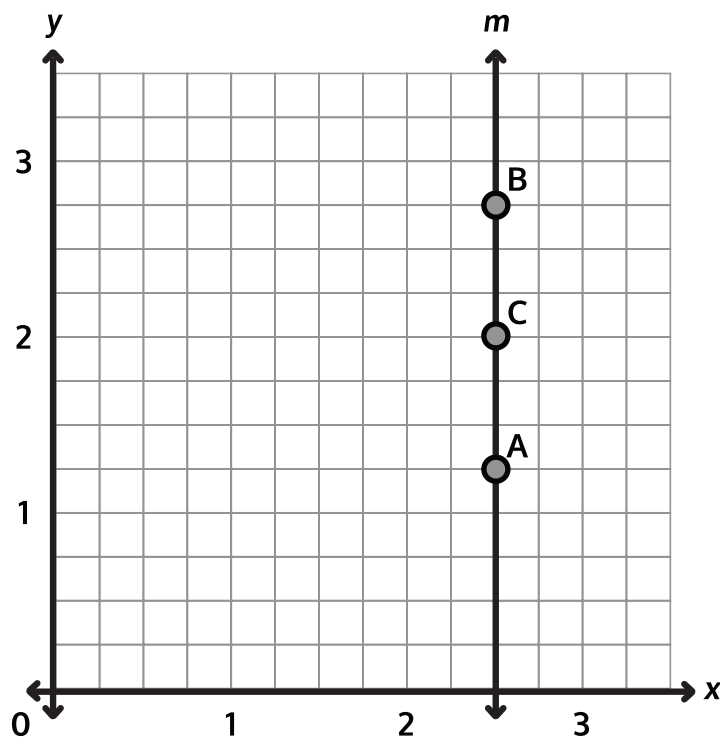
Point	x	y	(x,y)
A	$2\frac{1}{2}$	$1\frac{1}{4}$	
B			
C			

Point	x	y	(x,y)
D			
E			
F			

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

You'll need two colored pencils for this exit ticket.
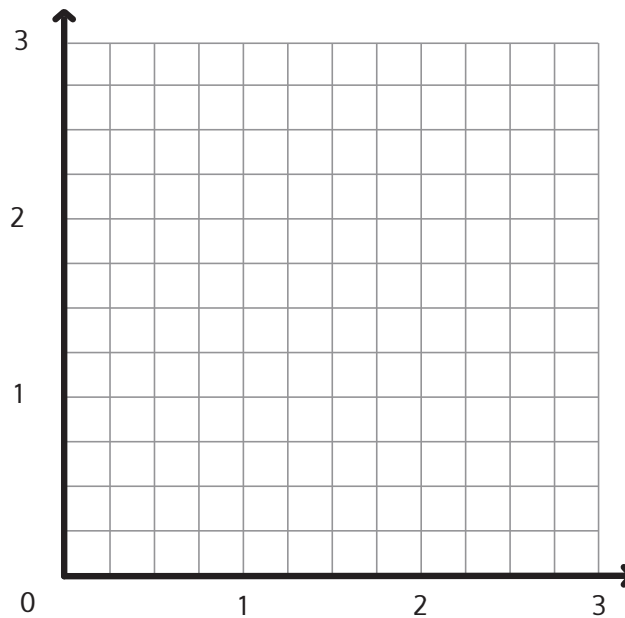
1. Plot the point $H(2\frac{1}{2}, 1\frac{1}{2})$.

2. Line l passes through point H and is parallel to the y-axis. Construct line l.

3. Construct line m such that the y-coordinate of every point is $\frac{3}{4}$.

4. Line m is _____ units from the x-axis.

5. Give the coordinates of the point on line m that is $\frac{1}{2}$ unit from the y-axis.

6. With one colored pencil, shade the portion of the plane that is less than $\frac{3}{4}$ unit from the *x*-axis.

7. With another colored pencil, shade the portion of the plane that is less than $2\frac{1}{2}$ units from the *y*-axis.

8. Plot a point that lies in the double shaded region. Give the coordinates of the point.

Lesson 7
G:5 M:6

That's the Point

ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

You will need a ruler or straight edge for this lesson.

1 Plot the points on the coordinate plane.

Then, write a rule to describe any point on the line.
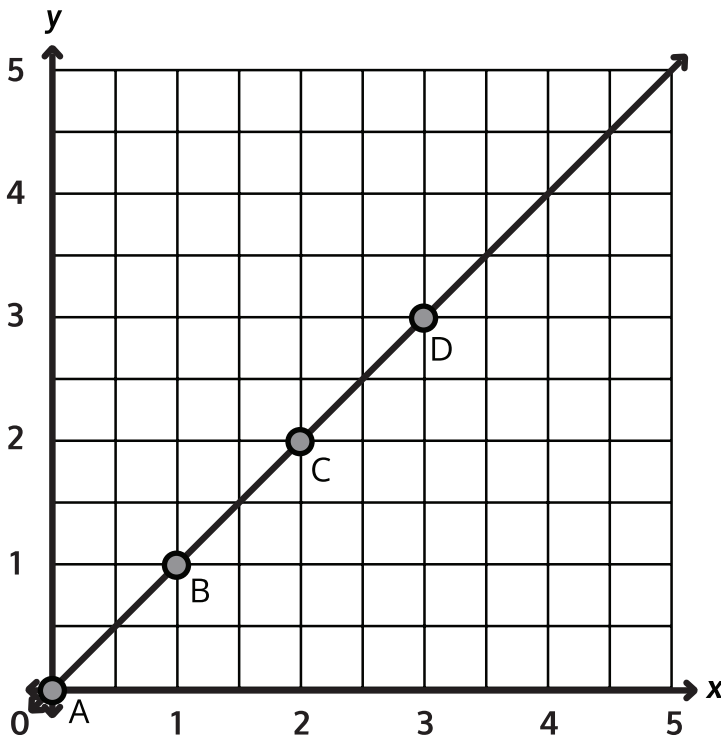
Point	(x, y)
G	$(0, 3)$
H	$(\frac{1}{2}, 3\frac{1}{2})$
I	$(1, 4)$
J	$(1\frac{1}{2}, 4\frac{1}{2})$
K	(_____, _____)

Rule: _____

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

Complete the chart. Then, plot the points on the coordinate plane.

x	y	(x,y)
0	4	
2	6	
3	7	
7	11	
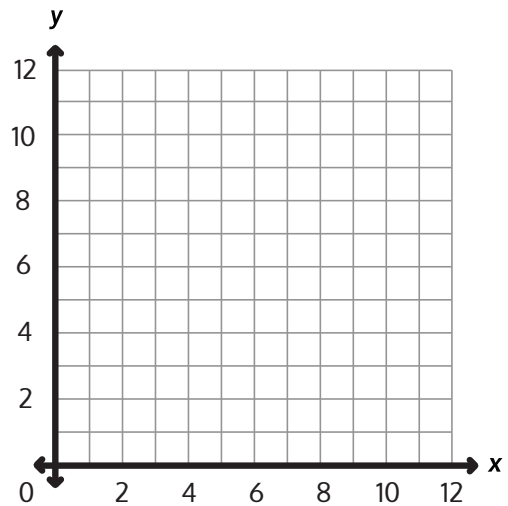
1. Use a straight edge to draw a line connecting these points.

2. Write a rule to show the relationship between the x- and y-coordinates for points on the line.

   _____

   _____

3. Name two other points that are also on this line.

   _____   _____

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Complete this table with values for *y* such that each *y*-coordinate is 5 more than 2 times as much as its corresponding *x*-coordinate.

   a. Plot each point on the coordinate plane.

   b. Use a straight edge to draw a line connecting these points.

   c. Name 2 other points that fall on this line with *y*-coordinates greater than 25.

x	*y*	(*x* , *y*)
0		
2		
3.5		
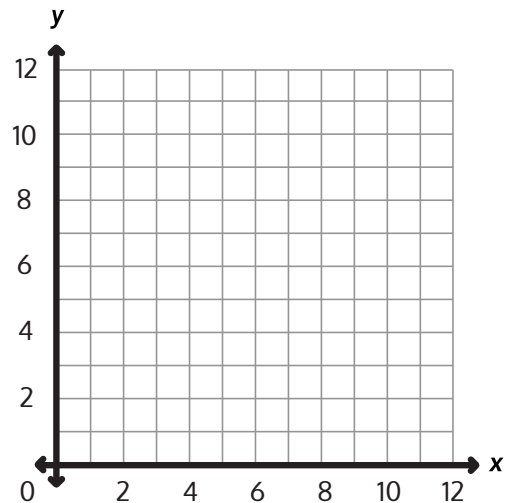
Lesson 9 G:5 M:6	Lasers on a Plane
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

You will need a ruler or straight edge for this lesson.

1 Complete the table with coordinates that follow each line's rule. Then, plot each line on the coordinate plane.

Line *p*
Rule: *y* is *x* times 2

x	*y*	(*x* , *y*)
0		
2		
4		

Line *q*
Rule: *y* is *x* times 3

x	*y*	(*x* , *y*)
0		
2		
4		

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Complete the table for the given rules.

   Then, construct lines *l* and *m* on the coordinate plane.

   Line *l*

   Rule: y *is 5 more than* x

x	y	(x , y)
0		
1		
2		
4		

   Line *m*

   Rule: y *is 5 times as much as* x

x	y	(x , y)
0		
1		
2		
4		
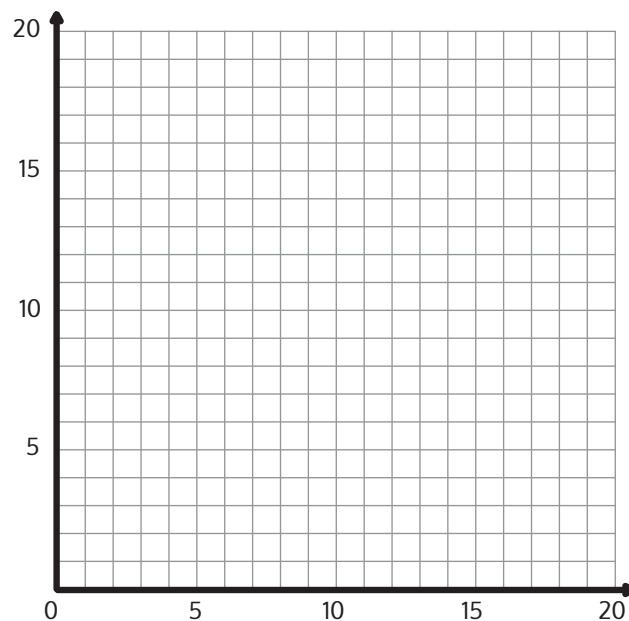
Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

You will need a ruler or straight edge for this lesson.

1 Plot points to draw each line. Then, write a rule for each line to describe its coordinates.

Line g Line h

Rule: _____   Rule: _____

x	y	(x,y)
1		
2		
5		

x	y	(x,y)
3		
6		
12		
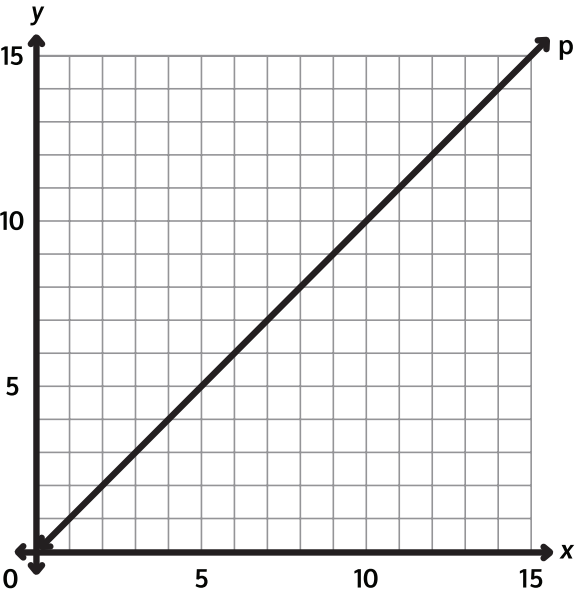
Name:_____ Date:_____

Complete: ☐ Class:_____

1. Use the coordinate plane below to complete the following tasks.

   a. Line *p* represents the rule x *and* y *are equal*.

   b. Construct a line, *a*, that is parallel to line *p* and contains point *A*.

   c. Name 3 points on line *a*.

   d. Identify a rule to describe line *a*.
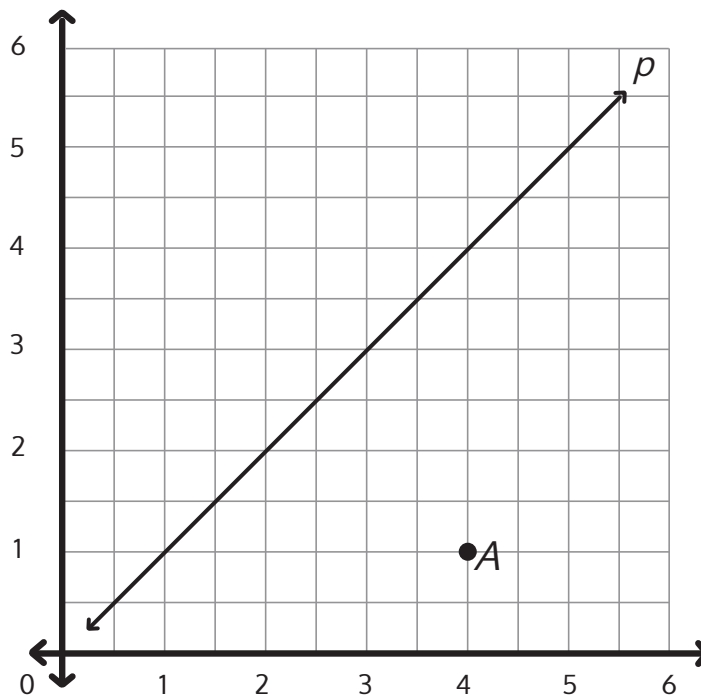
Lesson 14 G:5 M:6	Pairs and Parallels
	ZEARN STUDENT NOTES

Name:_____ **Date:**_____

Complete: ☐ **Class:**_____

You will need scissors and a ruler or straight edge for this lesson.

1 Use the triangle to draw parallel lines.

A: (2 , 3)   *B*: (7 , 5)

S: (_____ , _____)   *T*: (_____ , _____)

_____

Name:_____ **Date:**_____

Complete: ☐   **Class:**_____

1. Use the coordinate plane below to complete the following tasks.

    a. Identify the locations of E and F.

      E : (_____ , _____) F : (_____ , _____)

    b. Draw $\overleftrightarrow{EF}$.

    c. Generate coordinate pairs for L and M, such that $\overleftrightarrow{EF} \parallel \overleftrightarrow{LM}$.

      L : (_____ , _____) M : (_____ , _____)
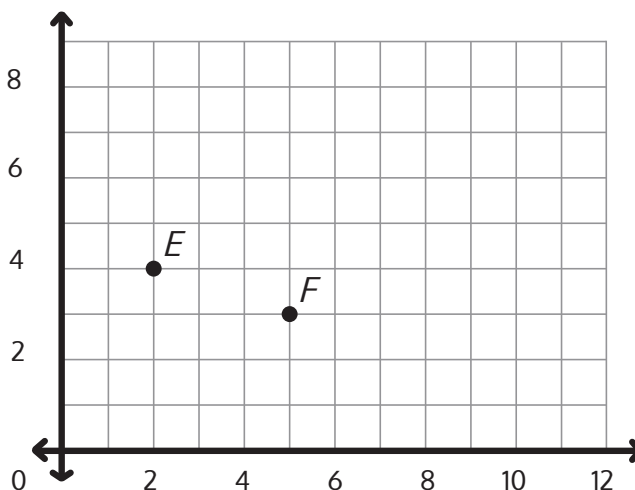
    d. Draw $\overleftrightarrow{LM}$.

Name:_____ Date:_____

Complete: ☐ Class:_____

1. Draw a segment perpendicular to each given segment. Show your thinking by sketching triangles as needed.

a.

b.

c.

d.

ZEARN
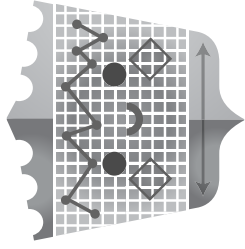
Congratulations!
You completed

Grade 5 Mission 6
The Coordinate Plane

Zearned it!

Name

Date

Section Two: Problem Sets and Homework
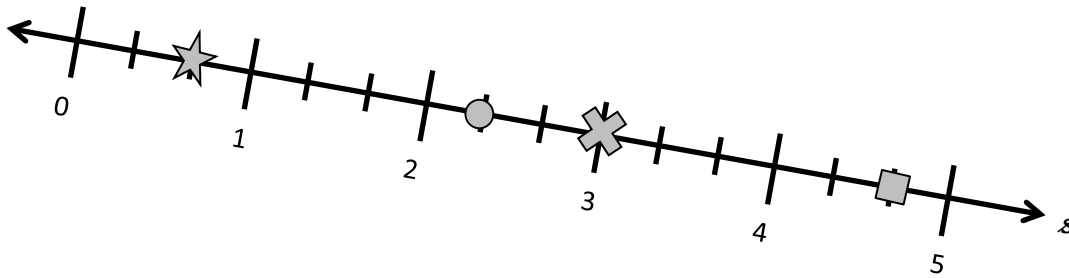*To complete if internet access is not available*

Name _____   Date _____

1. Each shape was placed at a point on the number line s. Give the coordinate of each point below.

   a. ✖ _____   b. ☆ _____

   c. ⬤ _____   d. ▢ _____
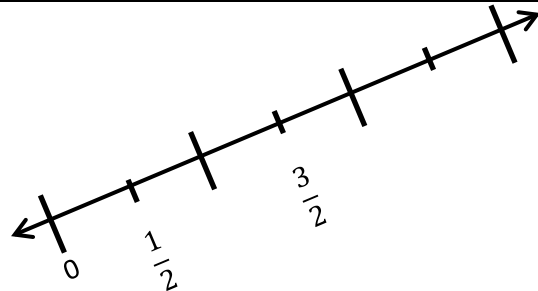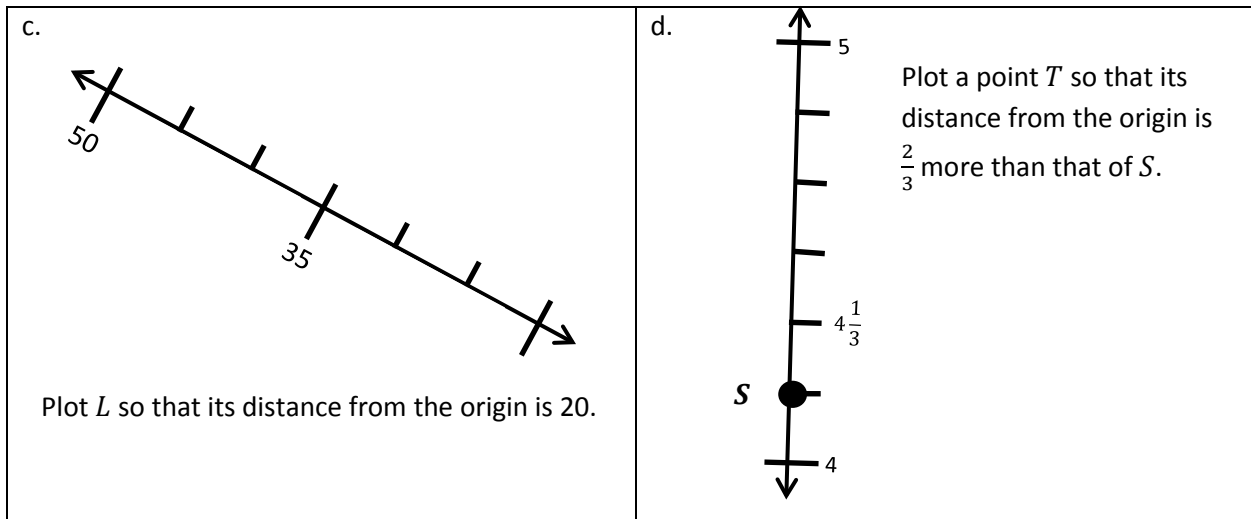

2. Plot the points on the number lines.
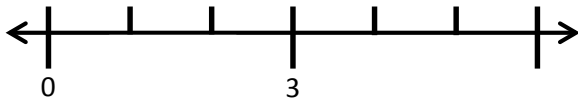
a.	b.
Plot A so that its distance from the origin is 2.	Plot R so that its distance from the origin is $\frac{5}{2}$.

c.

Plot L so that its distance from the origin is 20.

d.

Plot a point T so that its distance from the origin is $\frac{2}{3}$ more than that of S.

$4\frac{1}{3}$

S

4

3. Number line g is labeled from 0 to 6. Use number line g below to answer the questions.
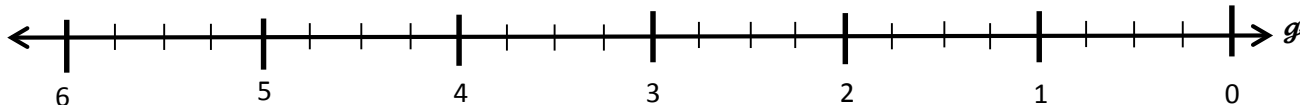
a. Plot point A at $\frac{3}{4}$.

b. Label a point that lies at $4\frac{1}{2}$ as B.

c. Label a point, C, whose distance from zero is 5 more than that of A.

The coordinate of C is _____.

d. Plot a point, D, whose distance from zero is $1\frac{1}{4}$ less than that of B.

The coordinate of D is _____.

e. The distance of E from zero is $1\frac{3}{4}$ more than that of D. Plot point E.

f. What is the coordinate of the point that lies halfway between A and D? _____
Label this point F.

4. Mrs. Fan asked her fifth-grade class to create a number line. Lenox created the number line below:

12   10   8   6   4   2   0
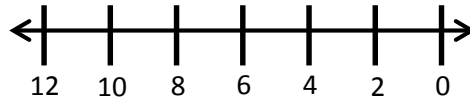
Parks said Lenox's number line is wrong because numbers should always increase from left to right. Who is correct? Explain your thinking.

5. A pirate marked the palm tree on his treasure map and buried his treasure 30 feet away. Do you think he will be able to easily find his treasure when he returns? Why or why not? What might he do to make it easier to find?


Look for the treasure 30 feet from this tree!

EUREKA MATH

Lesson 1:   Construct a coordinate system on a line.

engage^{ny}

Name _____   Date _____

1.

a. Use a set square to draw a line perpendicular to the x-axes through points P, Q, and R. Label the new line as the y-axis.

$\cdot Q$

$\cdot P$

x

R

x

x
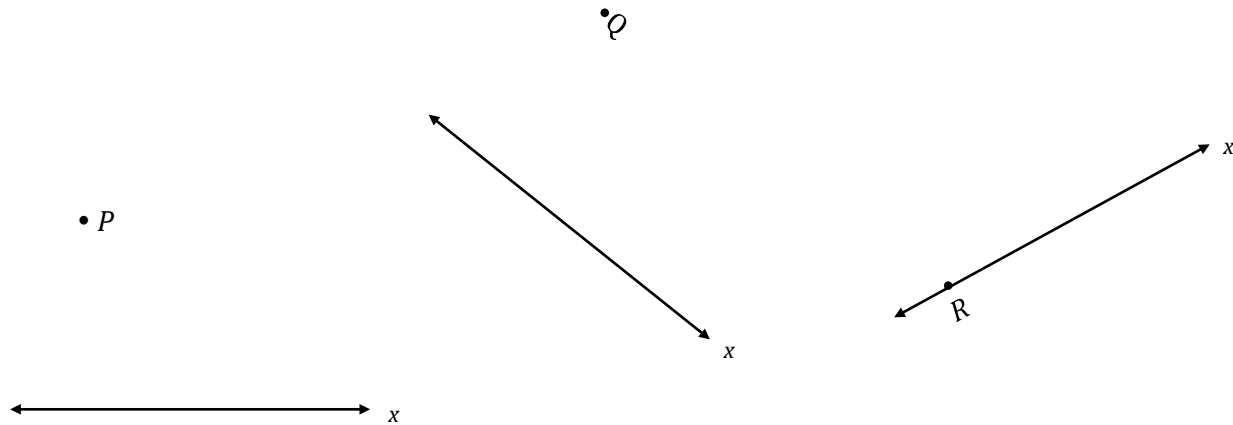
a. Choose one of the sets of perpendicular lines above, and create a coordinate plane. Mark 7 units on each axis, and label them as whole numbers.

2. Use the coordinate plane to answer the following.

a. Name the shape at each location.
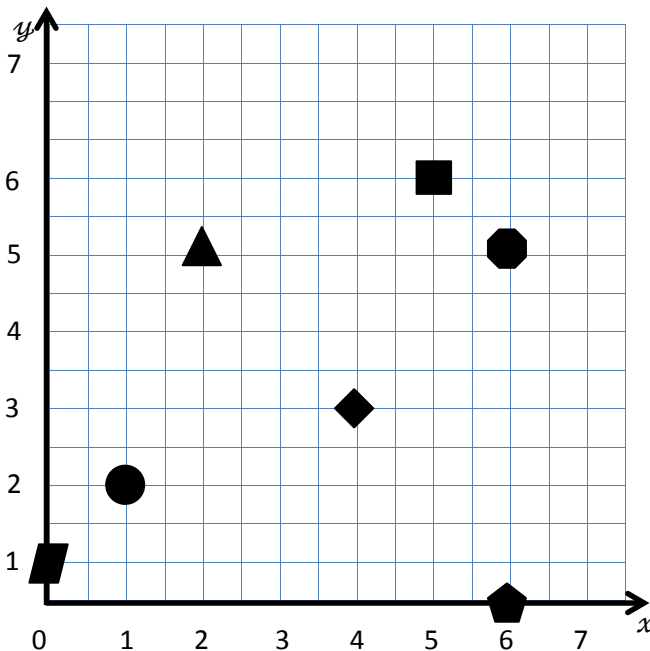
x-coordinate	y-coordinate	Shape
2	5	
1	2	
5	6	
6	5	

b. Which shape is 2 units from the y-axis?

c. Which shape has an x-coordinate of 0?

d. Which shape is 4 units from the y-axis and 3 units from the x-axis?

3. Use the coordinate plane to answer the following.
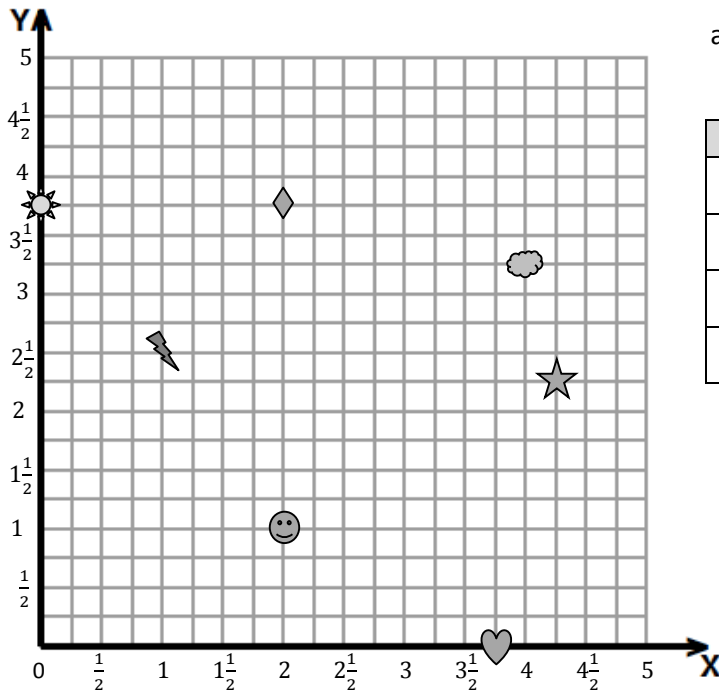
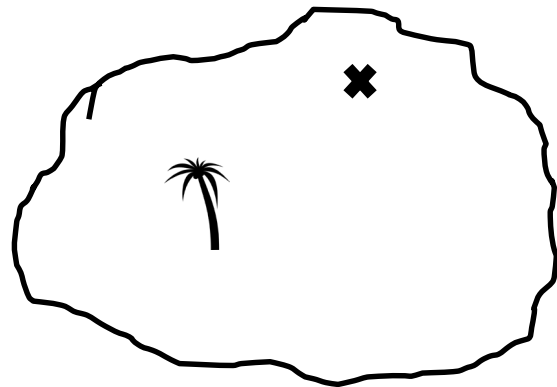

a. Fill in the blanks.

Shape	x-coordinate	y-coordinate
Smiley Face		
Diamond		
Sun		
Heart		

b. Name the shape whose x-coordinate is $\frac{1}{2}$ more than the value of the heart's x-coordinate.

c. Plot a triangle at (3, 4).   d. Plot a square at $(4\frac{3}{4}, 5)$.   e. Plot an X at $(\frac{1}{2}, \frac{3}{4})$.
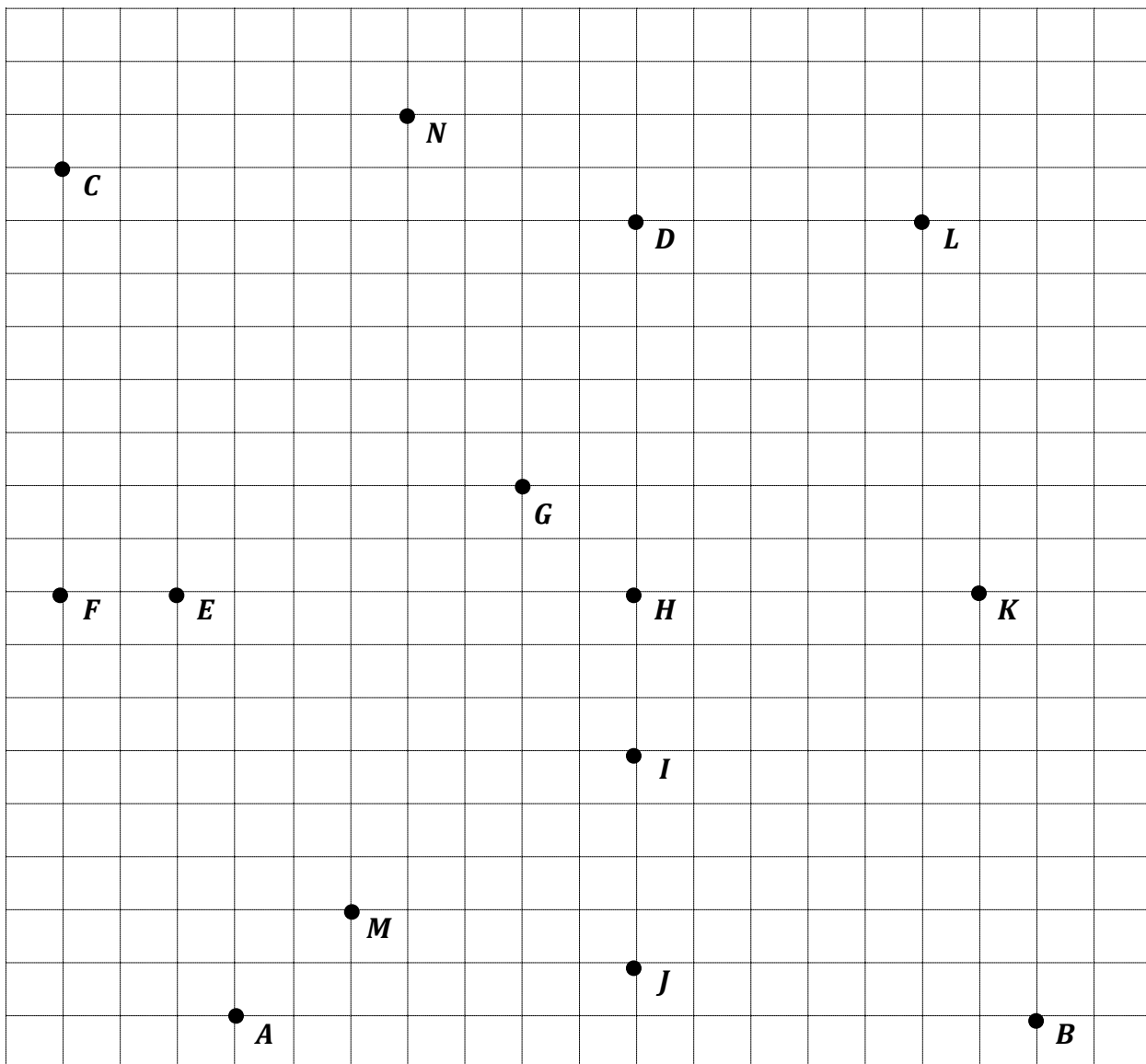
4. The pirate's treasure is buried at the ✖ on the map. How could a coordinate plane make describing its location easier?

Name _____   Date _____

1. Use the grid below to complete the following tasks.

    a. Construct an x-axis that passes through points A and B.

    b. Construct a perpendicular y-axis that passes through points C and F.

    c. Label the origin as 0.

    d. The x-coordinate of B is $5\frac{2}{3}$. Label the whole numbers along the x-axis.

    e. The y-coordinate of C is $5\frac{1}{3}$. Label the whole numbers along the y-axis.

EUREKA MATH

Lesson 3: Name points using coordinate pairs, and use the coordinate pairs to plot points.

engage^ny   49

Modified from original

2. For all of the following problems, consider the points A through N on the previous page.

    a. Identify all of the points that have an x-coordinate of $3\frac{1}{3}$.

    b. Identify all of the points that have a y-coordinate of $2\frac{2}{3}$.

    c. Which point is $3\frac{1}{3}$ units above the x-axis *and* $2\frac{2}{3}$ units to the right of the y-axis? Name the point, and give its coordinate pair.

    d. Which point is located $5\frac{1}{3}$ units from the y-axis?

    e. Which point is located $1\frac{2}{3}$ units along the x-axis?

    f. Give the coordinate pair for each of the following points.

        K: _____ I: _____ B: _____ C: _____

    g. Name the points located at the following coordinates.

        $(1\frac{2}{3}, \frac{2}{3})$ _____ $(0, 2\frac{2}{3})$ _____ $(1, 0)$ _____ $(2, 5\frac{2}{3})$ _____

    h. Which point has an equal x- and y-coordinate? _____

    i. Give the coordinates for the intersection of the two axes. (_____ , _____) Another name for this point on the plane is the _____.

    j. Plot the following points.

        P: $(4\frac{1}{3}, 4)$ Q: $(\frac{1}{3}, 6)$ R: $(4\frac{2}{3}, 1)$ S: $(0, 1\frac{2}{3})$

    k. What is the distance between E and H, or EH?

l.   What is the length of HD?

m.   Would the length of ED be greater or less than $EH + HD$?

n.   Jack was absent when the teacher explained how to describe the location of a point on the coordinate plane. Explain it to him using point J.

Modified from original
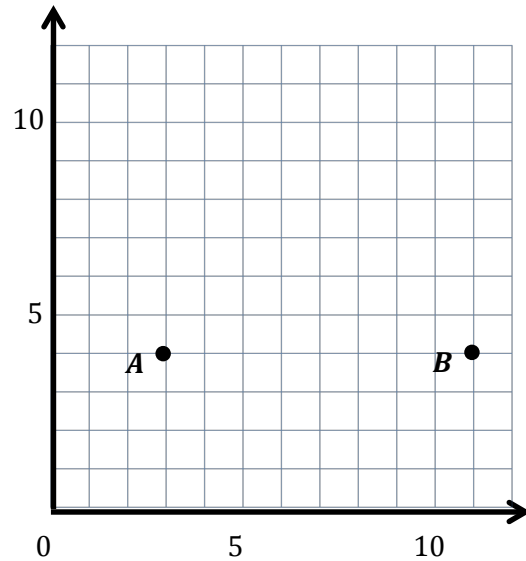
Name _____   Date _____

1. Use the coordinate plane to the right to answer the following questions.

   a. Use a straightedge to construct a line that goes through points A and B. Label the line e.

   b. Line e is parallel to the _____-axis and is perpendicular to the _____-axis.

   c. Plot two more points on line e. Name them C and D.

   d. Give the coordinates of each point below.

        $A:$ _____ $B:$ _____

        $C:$ _____ $D:$ _____

   e. What do all of the points of line e have in common?

   f. Give the coordinates of another point that would fall on line e with an x-coordinate greater than 15.

Lesson 5: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

75

Modified from original

2. Plot the following points on the coordinate plane to the right.

P: $(1\frac{1}{2}, \frac{1}{2})$ Q: $(1\frac{1}{2}, 2\frac{1}{2})$

R: $(1\frac{1}{2}, 1\frac{1}{4})$ S: $(1\frac{1}{2}, \frac{3}{4})$

   a. Use a straightedge to draw a line to connect these points. Label the line $\hbar$.

   b. In line $\hbar$, $x =$ _____ for all values of y.

   c. Circle the correct word.
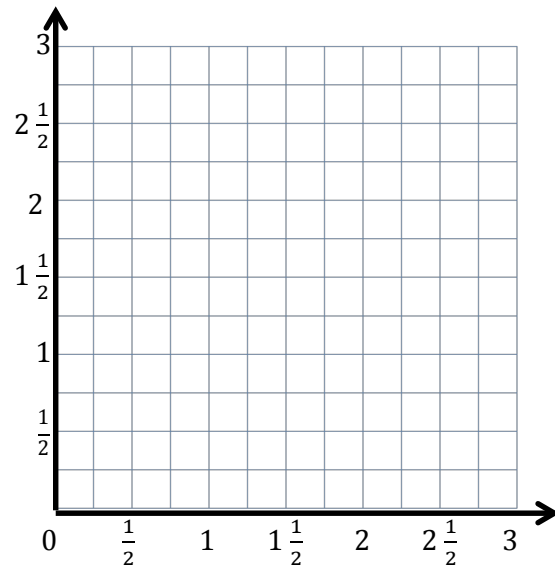
   Line $\hbar$ is *parallel*   *perpendicular* to the x-axis.

   Line $\hbar$ is *parallel*   *perpendicular* to the y-axis.

   d. What pattern occurs in the coordinate pairs that let you know that line $\hbar$ is vertical?

3. For each pair of points below, think about the line that joins them. For which pairs is the line parallel to the x-axis? Circle your answer(s). Without plotting them, explain how you know.

   a. (1.4, 2.2) and (4.1, 2.4)   b. (3, 9) and (8, 9)   c. $(1\frac{1}{4}, 2)$ and $(1\frac{1}{4}, 8)$

4. For each pair of points below, think about the line that joins them. For which pairs is the line parallel to the y-axis? Circle your answer(s). Then, give 2 other coordinate pairs that would also fall on this line.

   a. (4, 12) and (6, 12)   b. $(\frac{3}{5}, 2\frac{3}{5})$ and $(\frac{1}{5}, 3\frac{1}{5})$ c. (0.8, 1.9) and (0.8, 2.3)

EUREKA
MATH™

Lesson 5: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny   76

5. Write the coordinate pairs of 3 points that can be connected to construct a line that is $5\frac{1}{2}$ units to the right of and parallel to the y-axis.

   a. _____   b. _____   c. _____

6. Write the coordinate pairs of 3 points that lie on the x-axis.

   a. _____   b. _____   c. _____

7. Adam and Janice are playing Battleship. Presented in the table is a record of Adam's guesses so far.
   He has hit Janice's battleship using these coordinate pairs. What should he guess next? How do you know? Explain using words and pictures.

(3, 11)	hit
(2, 11)	miss
(3, 10)	hit
(4, 11)	miss
(3, 9)	miss

EUREKA MATH

Lesson 5: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny

77

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

(cc) BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

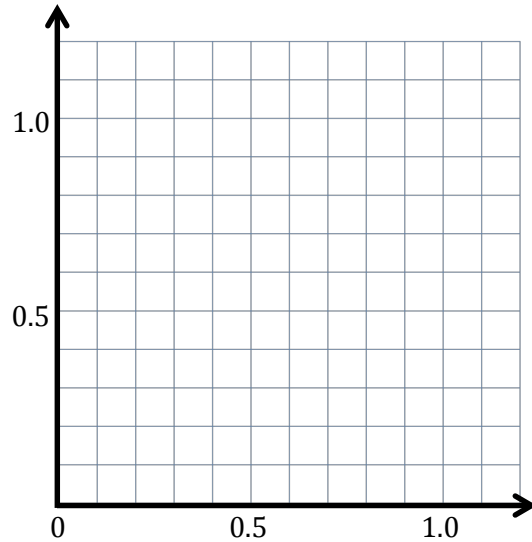1. Plot the following points, and label them on the coordinate plane.

A: (0.3, 0.1) B: (0.3, 0.7)

C: (0.2, 0.9) D: (0.4, 0.9)

a.   Use a straightedge to construct line segments $\overline{AB}$ and $\overline{CD}$.

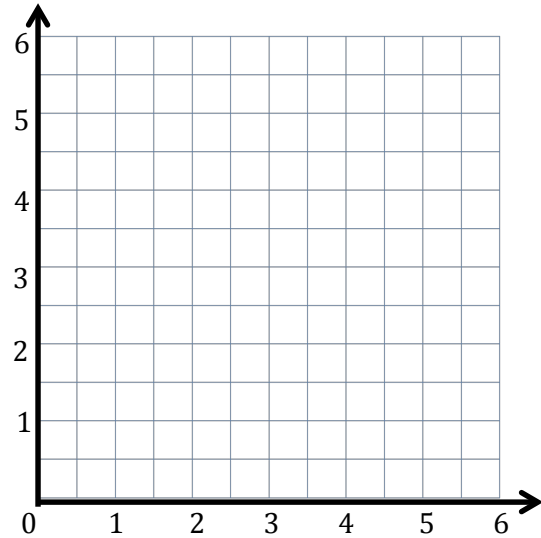b.   Line segment _____ is parallel to the x-axis and is perpendicular to the y-axis.

c.   Line segment _____ is parallel to the y-axis and is perpendicular to the x-axis.

d.   Plot a point on line segment $\overline{AB}$ that is not at the endpoints, and name it U. Write the coordinates.
     U (_____ , _____)
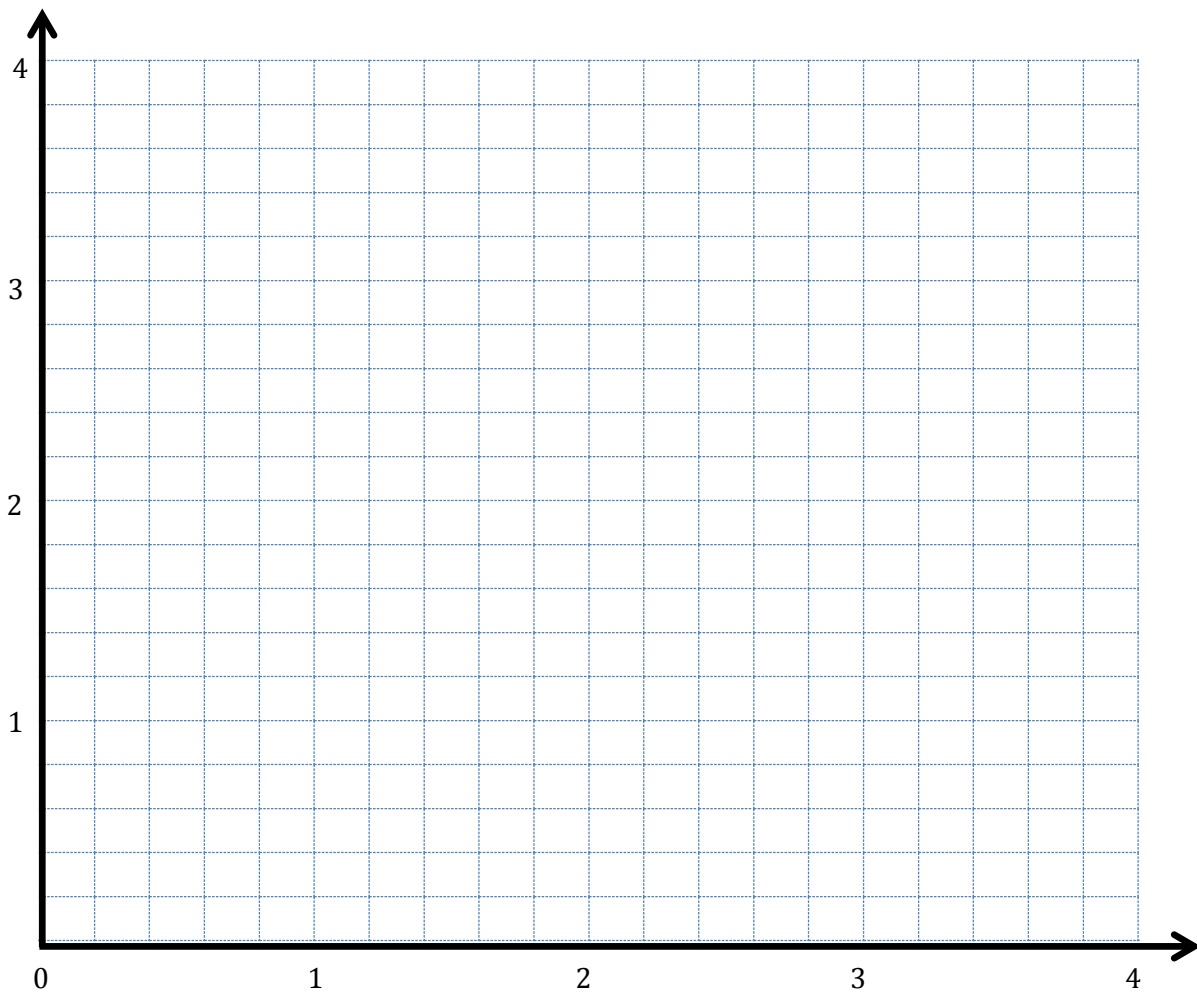
e.   Plot a point on line segment $\overline{CD}$, and name it V. Write the coordinates. V (_____ , _____)

EUREKA MATH

Lesson 6:   Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny

90

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

2. Construct line f such that the y-coordinate of every point is $3\frac{1}{2}$, and construct line g such that the x-coordinate of every point is $4\frac{1}{2}$.

    a. Line f is _____ units from the x-axis.

    b. Give the coordinates of the point on line f that is $\frac{1}{2}$ unit from the y-axis. _____

    c. With a blue pencil, shade the portion of the grid that is less than $3\frac{1}{2}$ units from the x-axis.

    d. Line g is _____ units from the y-axis.

    e. Give the coordinates of the point on line g that is 5 units from the x-axis. _____

    f. With a red pencil, shade the portion of the grid that is more than $4\frac{1}{2}$ units from the y-axis.

EUREKA MATH

Lesson 6: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^{ny}

91

Modified from original

3. Complete the following tasks on the plane below.

    a. Construct a line m that is perpendicular to the x-axis and 3.2 units from the y-axis.

    b. Construct a line a that is 0.8 unit from the x-axis.

    c. Construct a line t that is parallel to line m and is halfway between line m and the y-axis.

    d. Construct a line h that is perpendicular to line t and passes through the point (1.2, 2.4).

    e. Using a blue pencil, shade the region that contains points that are more than 1.6 units and less than 3.2 units from the y-axis.

    f. Using a red pencil, shade the region that contains points that are more than 0.8 unit and less than 2.4 units from the x-axis.

   g. Give the coordinates of a point that lies in the double-shaded region.

EUREKA
MATH™

Lesson 6:   Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny

92

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

Name _____   Date _____

1. Complete the chart. Then, plot the points on the coordinate plane below.

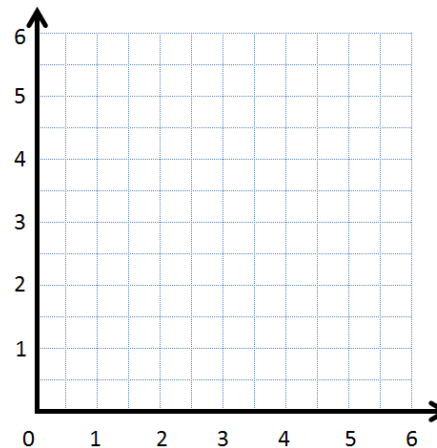| x	y	(x, y)
0	1	(0, 1)
2	3	
4	5	
6	7	
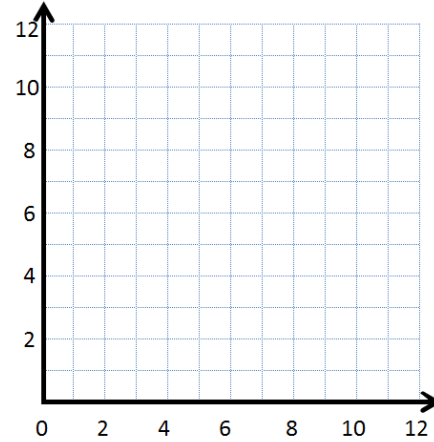
a. Use a straightedge to draw a line connecting these points.

b. Write a rule showing the relationship between the x- and y-coordinates of points on the line.
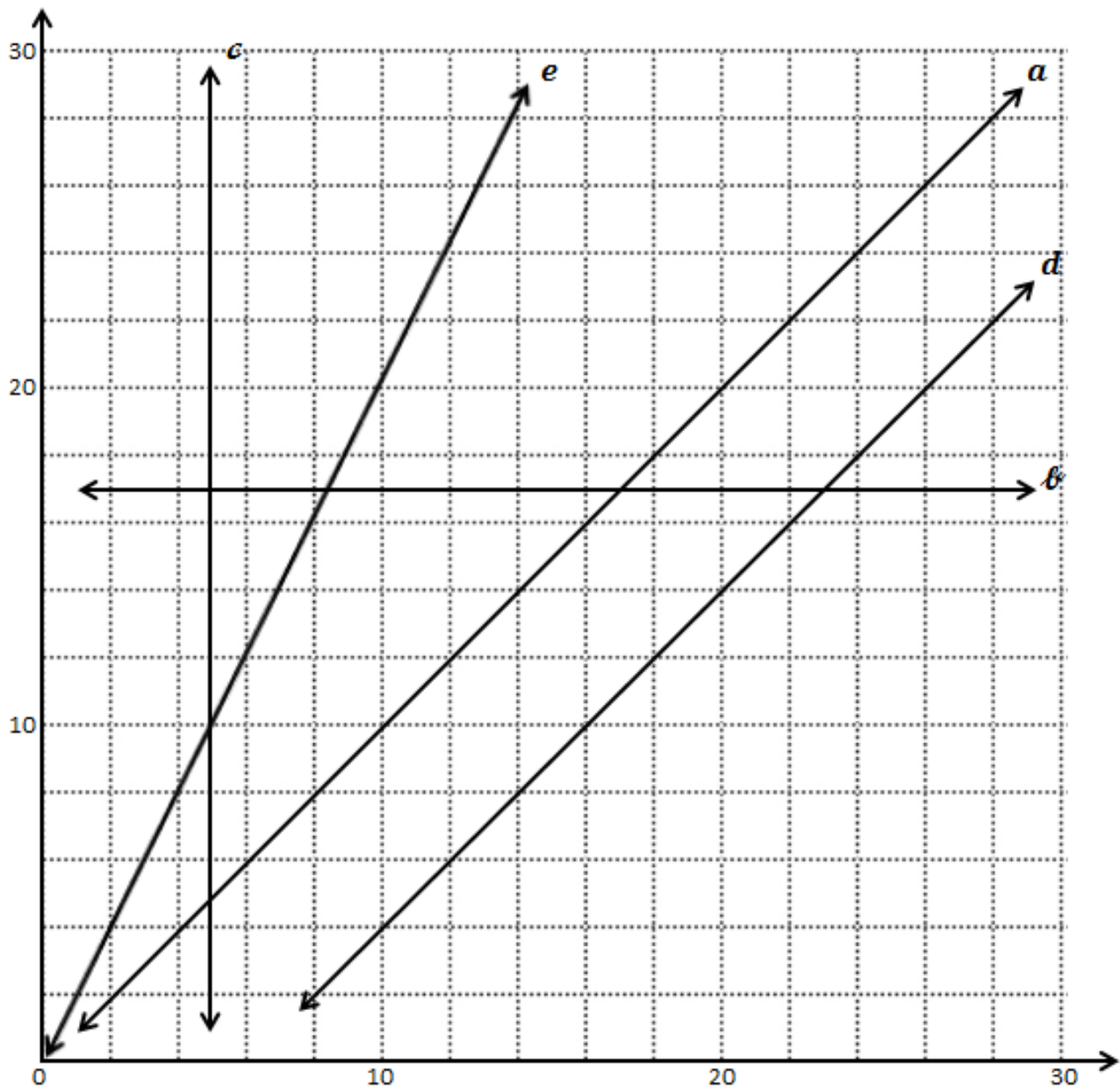
c. Name 2 other points that are on this line. _____   _____

2. Complete the chart. Then, plot the points on the coordinate plane below.

x	y	(x, y)
$\frac{1}{2}$	1	
1	2	
$1\frac{1}{2}$	3	
2	4	

a. Use a straightedge to draw a line connecting these points.

b. Write a rule showing the relationship between the x- and y-coordinates.

c. Name 2 other points that are on this line. _____   _____

EUREKA
MATH™

Lesson 7:   Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.

engage^ny   108

Modified from original

3. Use the coordinate plane below to answer the following questions.

a. Give the coordinates for 3 points that are on line a. _____ _____ _____

b. Write a rule that describes the relationship between the x- and y-coordinates for the points on line a.

EUREKA MATH™

Lesson 7: Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.

engage^{ny}

109

c. What do you notice about the y-coordinates of every point on line b?

d. Fill in the missing coordinates for points on line d.

(12, _____)   (6, _____)   (_____, 24)   (28, _____)   (_____, 28)

e. For any point on line c, the x-coordinate is _____.

f. Each of the points lies on at least 1 of the lines shown in the plane on the previous page. Identify a line that contains each of the following points.

i.   (7, 7) ___ a ___

ii. (14, 8) _____

iii. (5, 10) _____

iv. (0, 17) _____

v.   (15.3, 9.3) _____

vi. (20, 40) _____

EUREKA MATH™

Lesson 7: Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.

engage^ny   110

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

Name _____   Date _____

1. Create a table of 3 values for x and y such that each y-coordinate is 3 more than the corresponding x-coordinate.
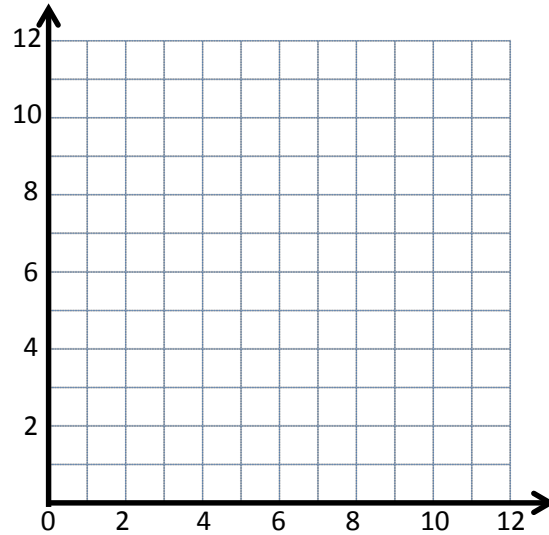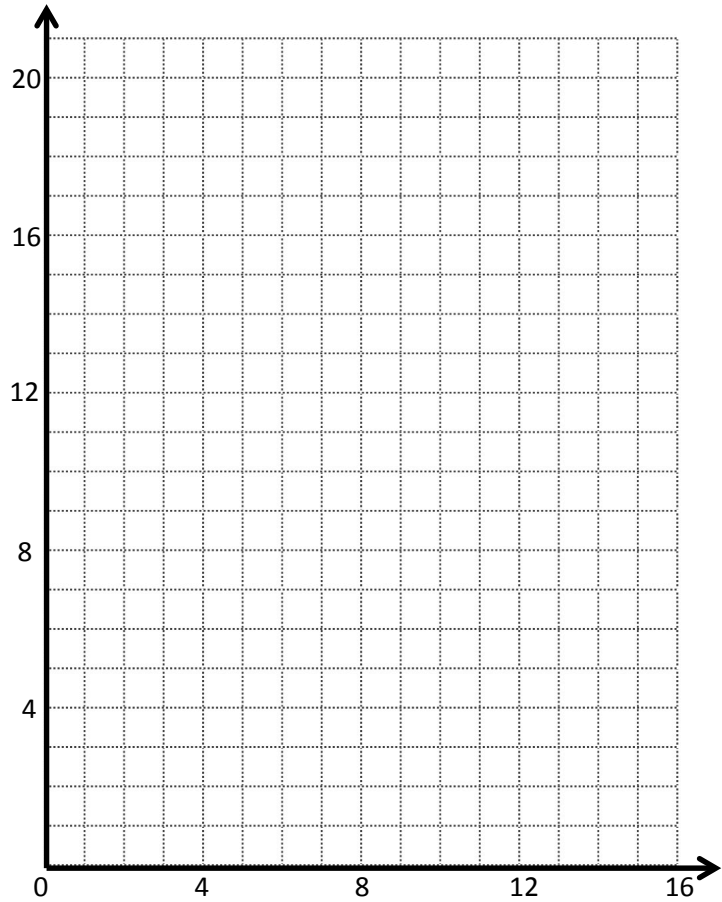
x	y	(x, y)

a. Plot each point on the coordinate plane.

b. Use a straightedge to draw a line connecting these points.

c. Give the coordinates of 2 other points that fall on this line with x-coordinates greater than 12.

  (_____ , _____) and (_____ , _____)

2. Create a table of 3 values for x and y such that each y-coordinate is 3 times as much as its corresponding x-coordinate.
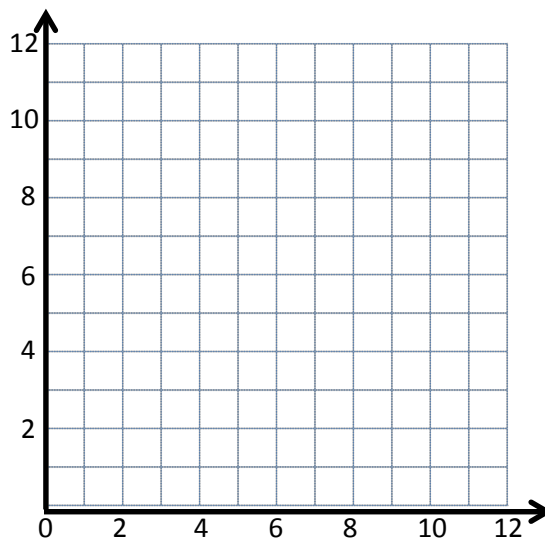
x	y	(x, y)

a. Plot each point on the coordinate plane.

b. Use a straightedge to draw a line connecting these points.

c. Give the coordinates of 2 other points that fall on this line with y-coordinates greater than 25.

(_____ , _____) and (_____ , _____)

EUREKA MATH

Lesson 8: Generate a number pattern from a given rule, and plot the points.

engage^ny

126

Modified from original

3. Create a table of 5 values for x and y such that each y-coordinate is 1 more than 3 times as much as its corresponding x value.

x	y	(x, y)

a. Plot each point on the coordinate plane.

b. Use a straightedge to draw a line connecting these points.

c. Give the coordinates of 2 other points that would fall on this line whose x-coordinates are greater than 12.
   (_____ , _____) and (_____ , _____)

EUREKA MATH™

Lesson 8:   Generate a number pattern from a given rule, and plot the points.

engage^ny   127

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

4. Use the coordinate plane below to complete the following tasks.

a. Graph the lines on the plane.

line ℓ: x is equal to y

	x	y	(x, y)
A			
B			
C			

line m: y is 1 more than x

	x	y	(x, y)
G			
H			
I			

line n: y is 1 more than twice x

	x	y	(x, y)
S			
T			
U			
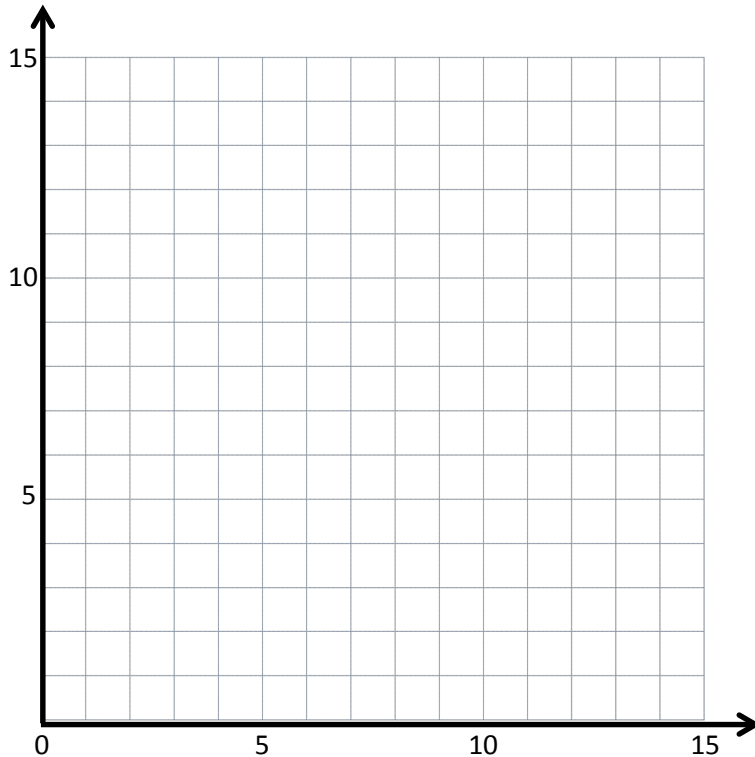
b. Which two lines intersect? Give the coordinates of their intersection.

c. Which two lines are parallel?

d. Give the rule for another line that would be parallel to the lines you listed in Problem 4(c).

Lesson 8:   Generate a number pattern from a given rule, and plot the points.

engage^ny   128

Name _____   Date _____

1. Complete the table for the given rules.

Line a

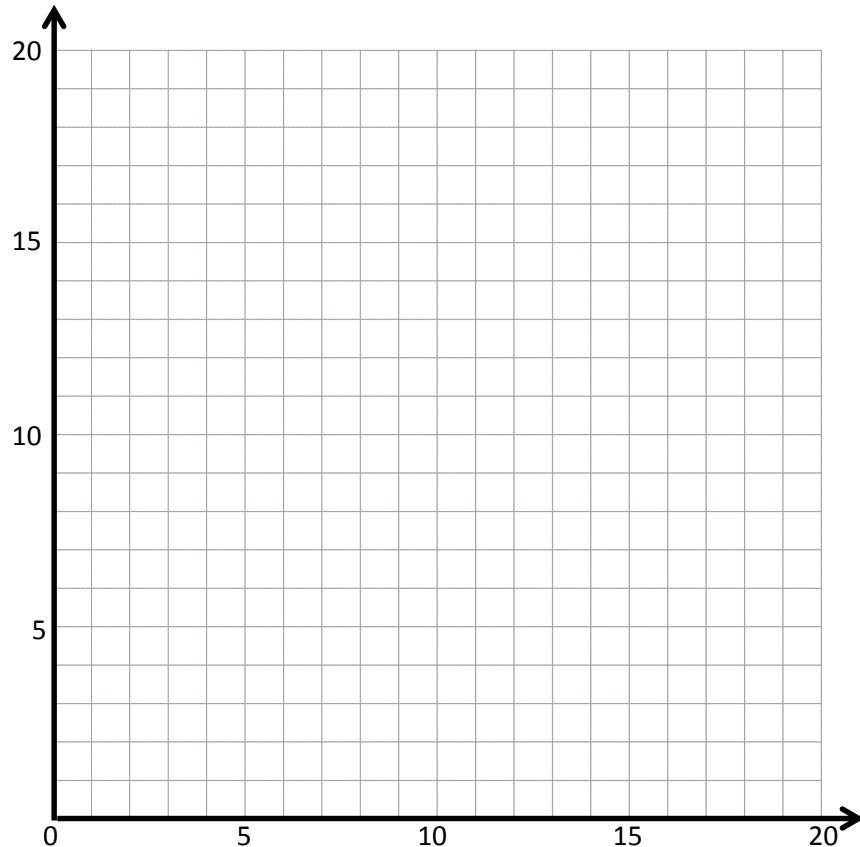*Rule: y is 1 more than x*

x	y	(x, y)
1		
5		
9		
13		

Line b

Rule: y is 4 more than x

x	y	(x, y)
0		
5		
8		
11		

a. Construct each line on the coordinate plane above.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what line c, whose rule is *y is 7 more than x*, would look like. Draw your prediction on the plane above.

EUREKA MATH

Lesson 9   Generate two number patterns from given rules, plot the points, and analyze the patterns.

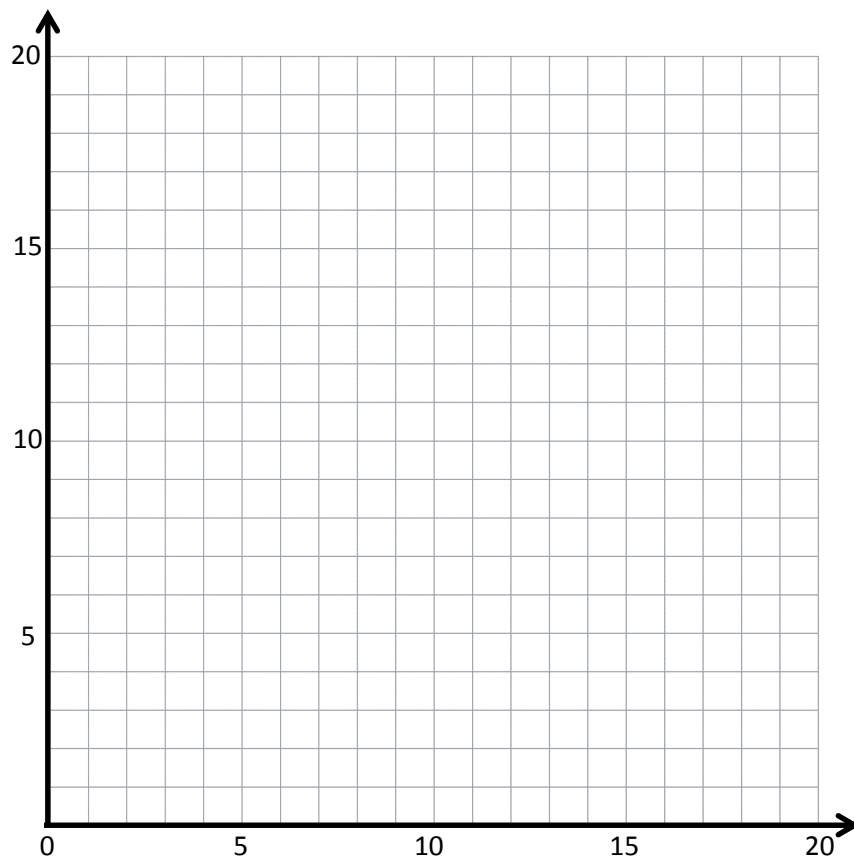engage^ny   141

2. Complete the table for the given rules.

Line e

Rule: y is twice as much as x

x	y	(x, y)
0		
2		
5		
9		

Line f

Rule: y is half as much as x

x	y	(x, y)
0		
6		
10		
20		

a. Construct each line on the coordinate plane above.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what line g, whose rule is *y is 4 times as much as x*, would look like. Draw your prediction in the plane above.

EUREKA MATH

Lesson 9 Generate two number patterns from given rules, plot the points, and analyze the patterns.

engageny

142

Name _____   Date _____

1. Use the coordinate plane below to complete the following tasks.

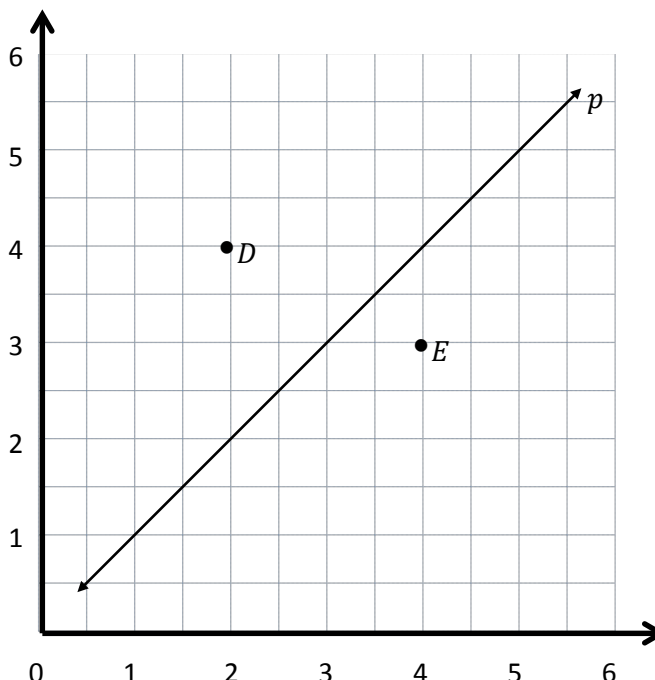   a. Line p represents the rule *x and y are equal.*

    b. Construct a line, d, that is parallel to line p and contains point D.

    c. Name 3 coordinate pairs on line d.

    d. Identify a rule to describe line d.

    e. Construct a line, e, that is parallel to line p and contains point E.

    f. Name 3 points on line e.

    g. Identify a rule to describe line e.

    h. Compare and contrast lines d and e in terms of their relationship to line p.

2. Write a rule for a fourth line that would be parallel to those above and would contain the point $(3\frac{1}{2}, 6)$. Explain how you know.

EUREKA MATH™

Lesson 10 Compare the lines and patterns generated by addition rules and multiplicative rules.

Modified from original

engage^ny   155

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

3. Use the coordinate plane below to complete the following tasks.

   a. Line p represents the rule *x and y are equal*.

   b. Construct a line, v, that contains the origin and point V.

   c. Name 3 points on line v.
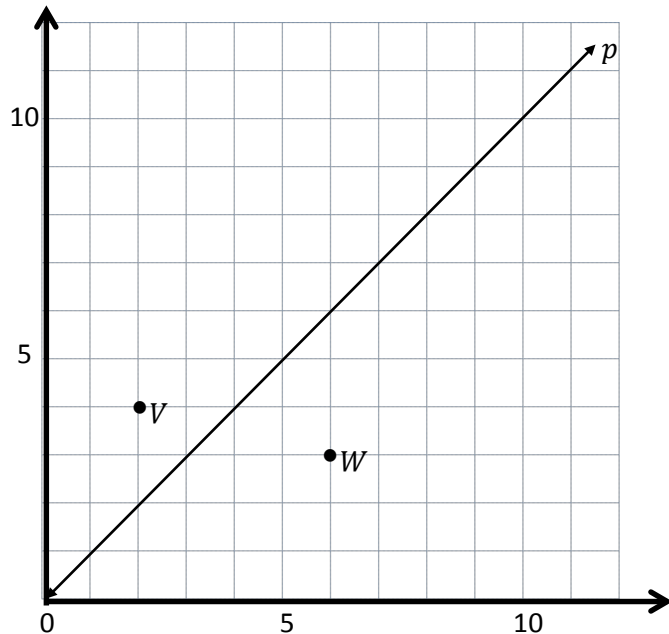
   d. Identify a rule to describe line v.

   e. Construct a line, w, that contains the origin and point W.

   f. Name 3 points on line w.

   g. Identify a rule to describe line w.

   h. Compare and contrast lines v and w in terms of their relationship to line p.

   i. What patterns do you see in lines that are generated by multiplication rules?

4. Circle the rules that generate lines that are parallel to each other.
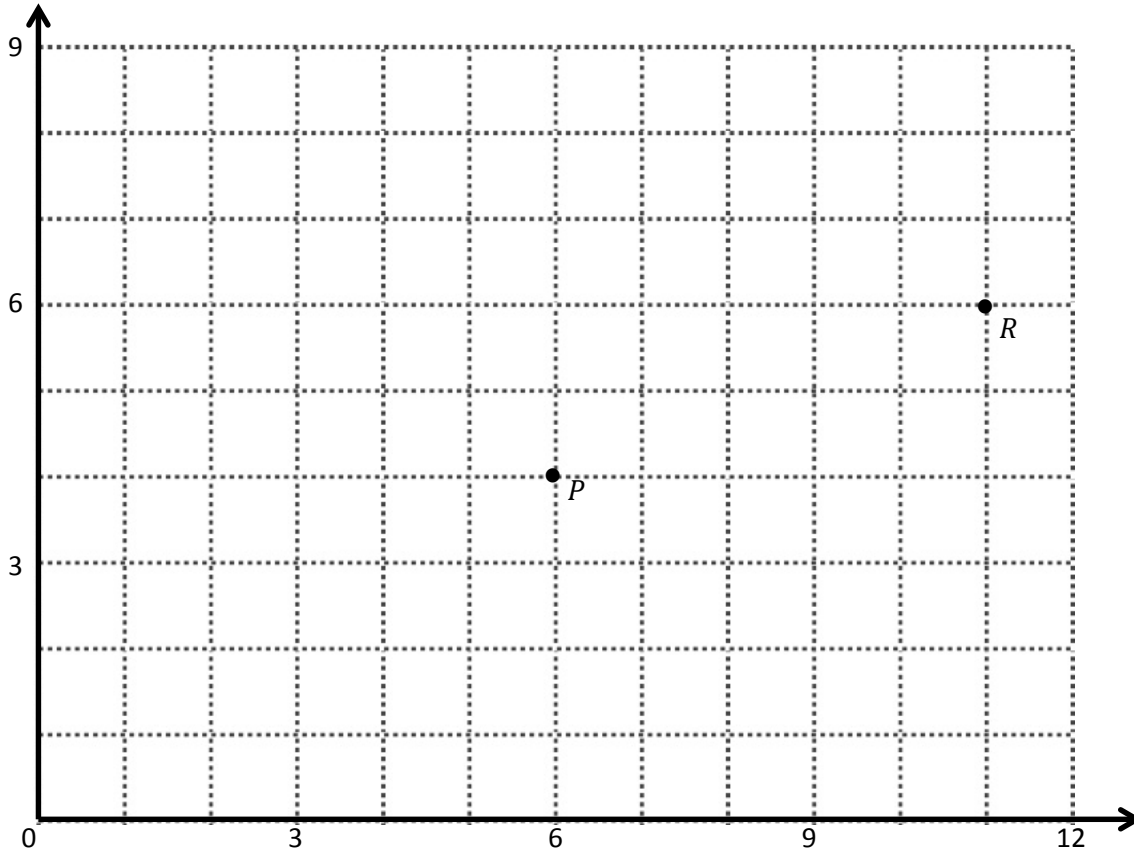
   add 5 to x   *multiply x by $\frac{2}{3}$*   *x plus $\frac{1}{2}$*   *x times $1\frac{1}{2}$*

EUREKA MATH

Lesson 10   Compare the lines and patterns generated by addition rules and multiplicative rules.
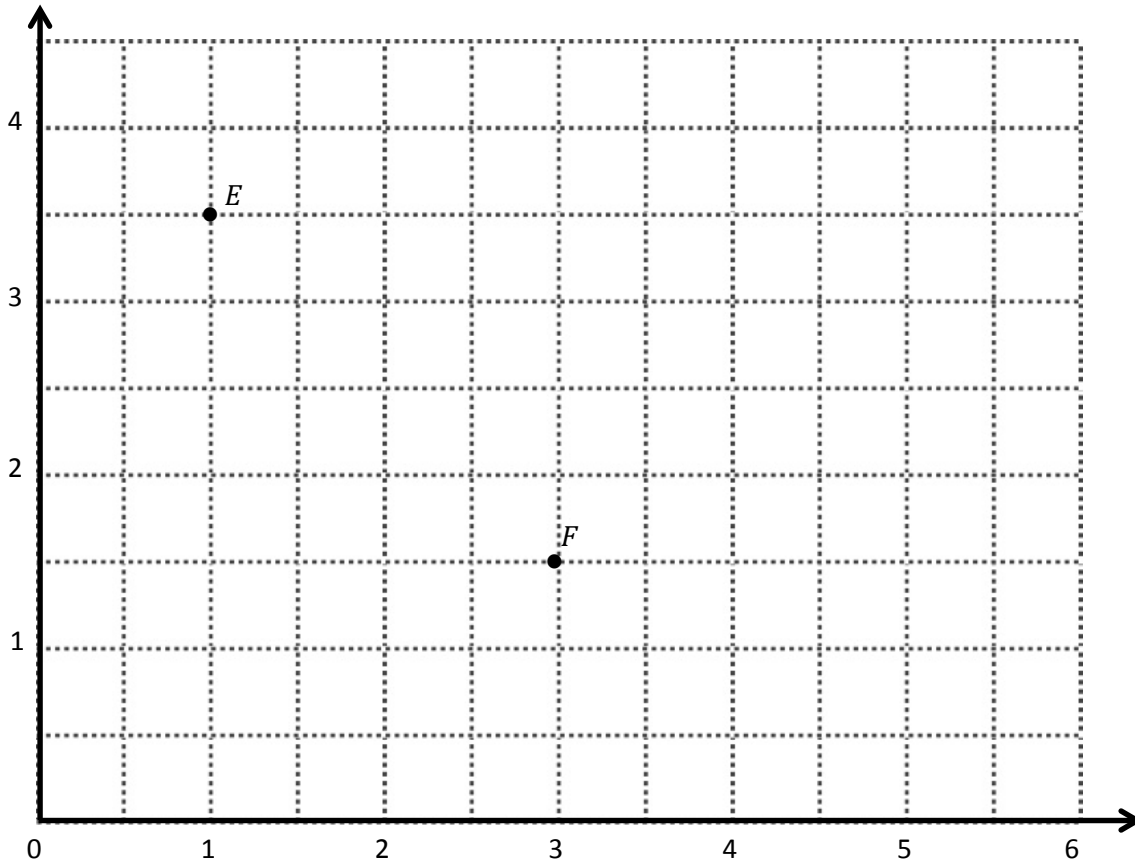
engage^ny   156

Name _____   Date _____

1. Use the coordinate plane below to complete the following tasks.

a. Identify the locations of P and R. P: (_____, _____) R: (_____, _____)

b. Draw $\overleftrightarrow{PR}$.

c. Plot the following coordinate pairs on the plane.

    S: (6, 7) T: (11, 9)

d. Draw $\overleftrightarrow{ST}$.

e. Circle the relationship between $\overleftrightarrow{PR}$ and $\overleftrightarrow{ST}$. $\overleftrightarrow{PR} \perp \overleftrightarrow{ST}$ $\overleftrightarrow{PR} \parallel \overleftrightarrow{ST}$

f. Give the coordinates of a pair of points, U and V, such that $\overleftrightarrow{UV} \parallel \overleftrightarrow{PR}$.

    U: (_____, _____) V: (_____, _____)

g. Draw $\overleftrightarrow{UV}$.

EUREKA
MATH™

Lesson 14:   Construct parallel line segments, and analyze relationships of the
coordinate pairs.

engage^ny   225

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

CC BY-NC-SA   This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

2. Use the coordinate plane below to complete the following tasks.

a. Identify the locations of E and F. E: (_____, _____) F: (_____, _____)

b. Draw $\overleftrightarrow{EF}$.

c. Generate coordinate pairs for L and M, such that $\overleftrightarrow{EF} \parallel \overleftrightarrow{LM}$.

L: (____, ____) M: (____, ____)

d. Draw $\overleftrightarrow{LM}$.

e. Explain the pattern you made use of when generating coordinate pairs for L and M.

f. Give the coordinates of a point, H, such that $\overleftrightarrow{EF} \parallel \overleftrightarrow{GH}$.

G: $(1\frac{1}{2}, 4)$ H: (____, ____)

g. Explain how you chose the coordinates for H.
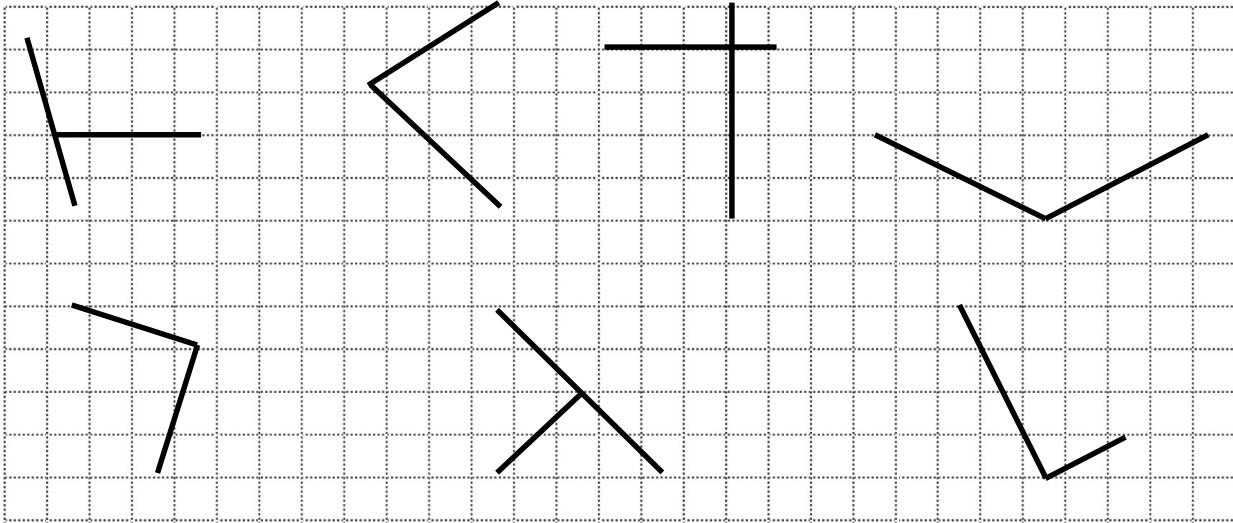
EUREKA MATH

Lesson 14: Construct parallel line segments, and analyze relationships of the coordinate pairs.

engage^ny **226**

Name _____   Date _____

1. Circle the pairs of segments that are perpendicular.

2. In the space below, use your right triangle templates to draw at least 3 different sets of perpendicular lines.

3. Draw a segment perpendicular to each given segment. Show your thinking by sketching triangles as needed.

a.

b.

c.

d.

4. Draw 2 different lines perpendicular to line e.

e

Lesson 15:   Construct perpendicular line segments on a rectangular grid.

238
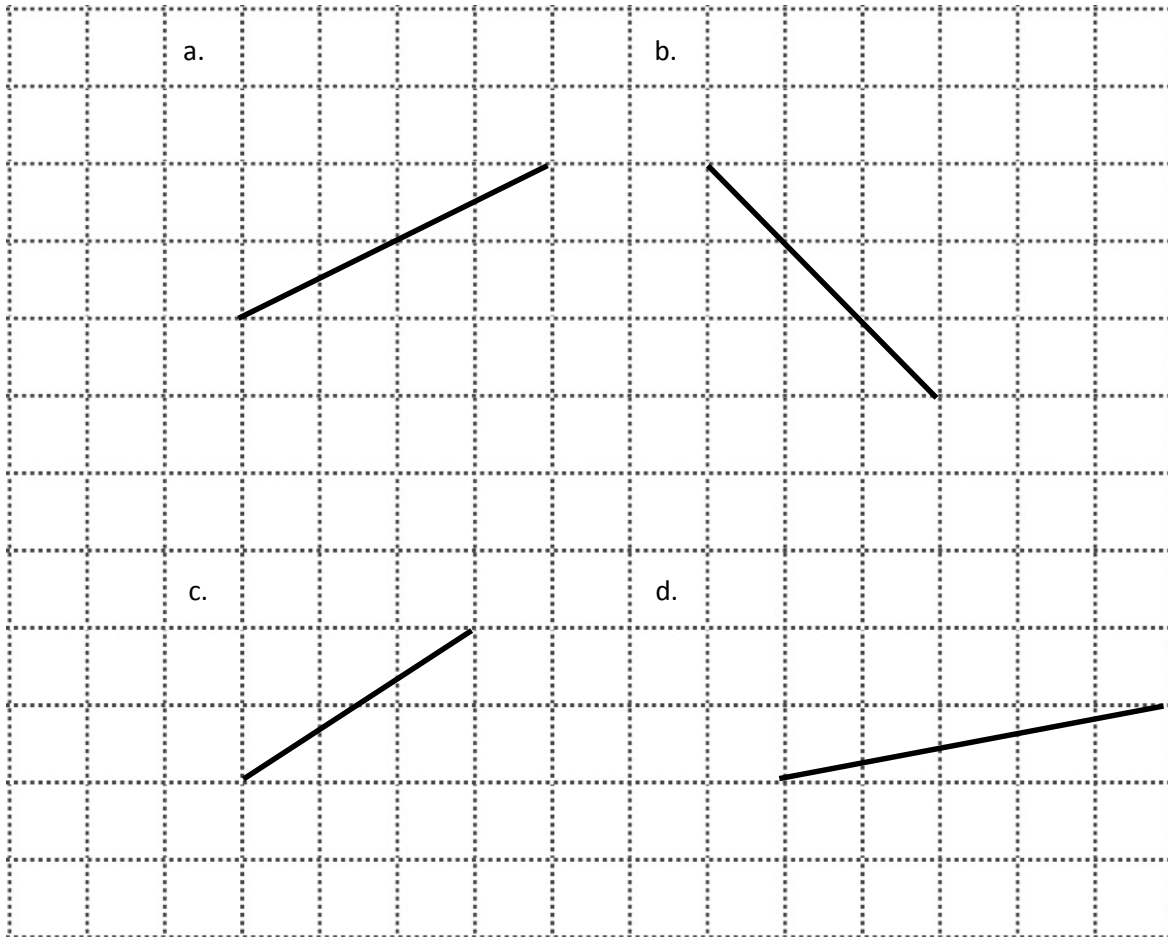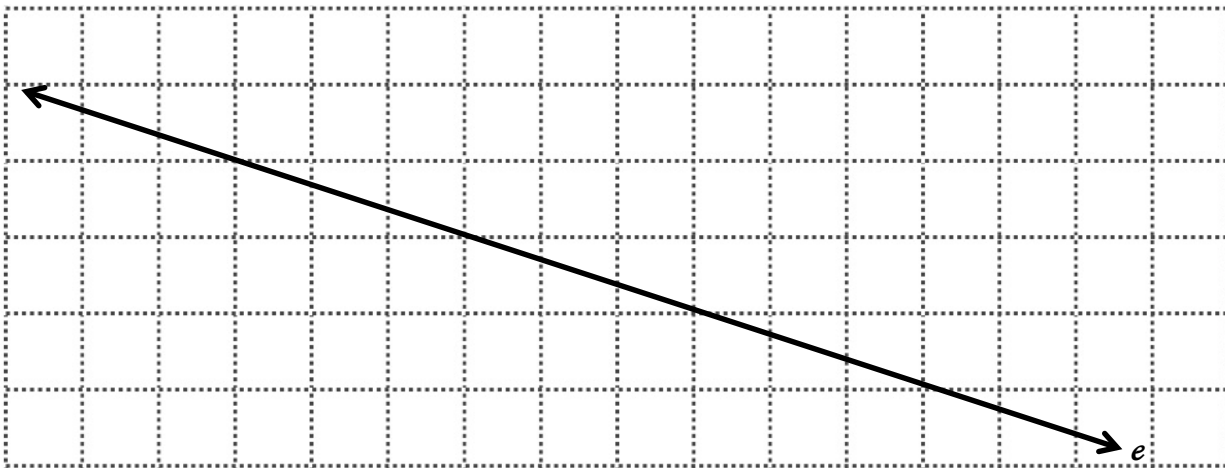
Start of Homework section for Mission 6

Name _____   Date _____

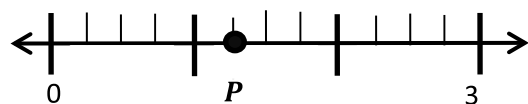1. Answer the following questions using number line q below.

   a. What is the coordinate, or the distance from the origin, of the 😊 ? _____

   b. What is the coordinate of the ⚡ ? _____

   c. What is the coordinate of the 🤍 ? _____

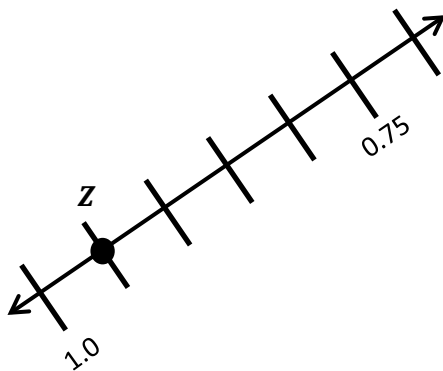   d. What is the coordinate at the midpoint of the ⚡ and the 🤍 ? _____
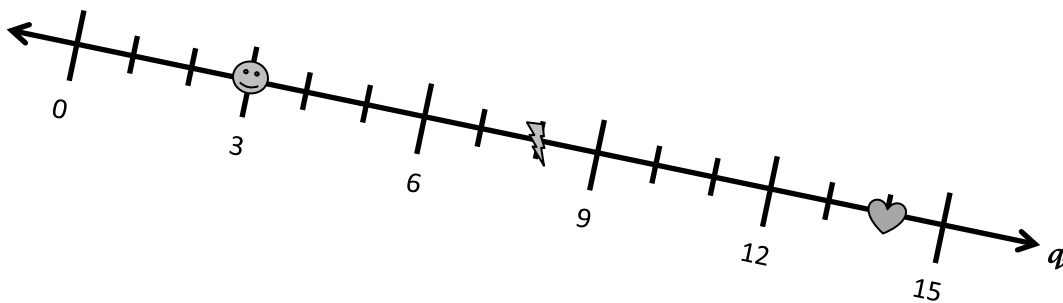
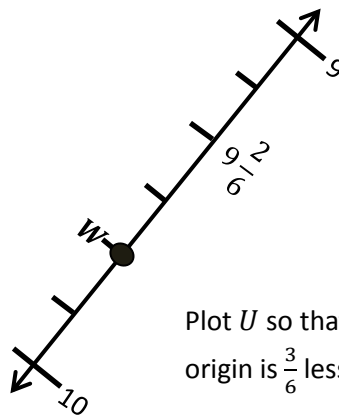2. Use the number lines to answer the questions.
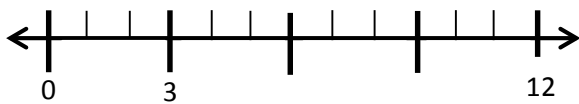
   Plot T so that its distance from the origin is 10.

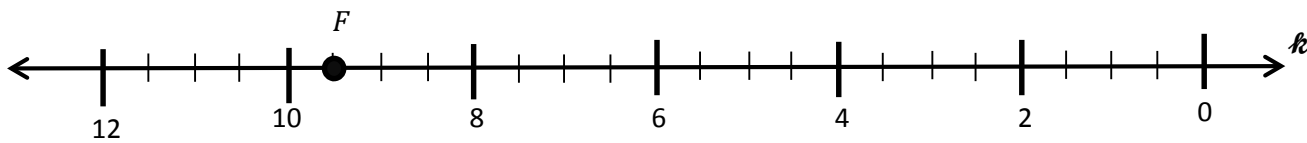   Plot M so that its distance is $\frac{11}{4}$ from the origin. What is the distance from P to M?

   Plot a point that is 0.15 closer to the origin than Z.

   Plot U so that its distance from the origin is $\frac{3}{6}$ less than that of W.

3. Number line k shows 12 units. Use number line k below to answer the questions.

F

```
←――┼―┼┼┼―┼―┼┼┼―┼―┼┼┼―┼―┼┼┼―┼―┼┼┼―┼――→ $k$
   12      10      8       6       4       2       0
```

a. Plot a point at 1. Label it A.

b. Label a point that lies at $3\frac{1}{2}$ as B.

c. Label a point, C, whose distance from zero is 8 units farther than that of B.

The coordinate of C is _____.

d. Plot a point, D, whose distance from zero is $\frac{6}{2}$ less than that of B.

The coordinate of D is _____.

e. What is the coordinate of the point that lies $\frac{17}{2}$ farther from the origin than D?

Label this point E.

f. What is the coordinate of the point that lies halfway between F and D?

Label this point G.

4. Mr. Baker's fifth-grade class buried a time capsule in the field behind the school. They drew a map and marked the location of the capsule with an ✖ so that his class can dig it up in ten years. What could Mr. Baker's class have done to make the capsule easier to find?

PLAYGROUND

✖

BASEBALL

SCHOOL

Name _____   Date _____

1.
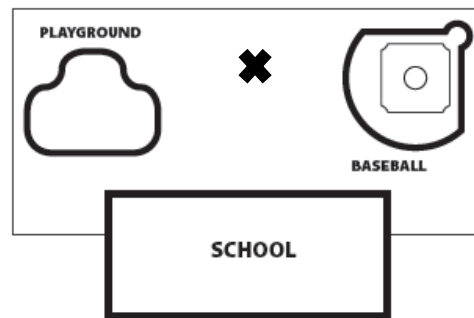
    a.   Use a set square to draw a line perpendicular to the x-axis through point P. Label the new line as the y-axis.
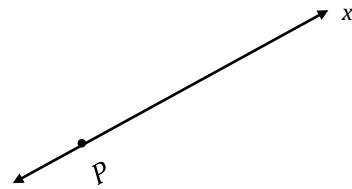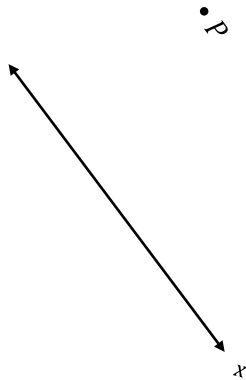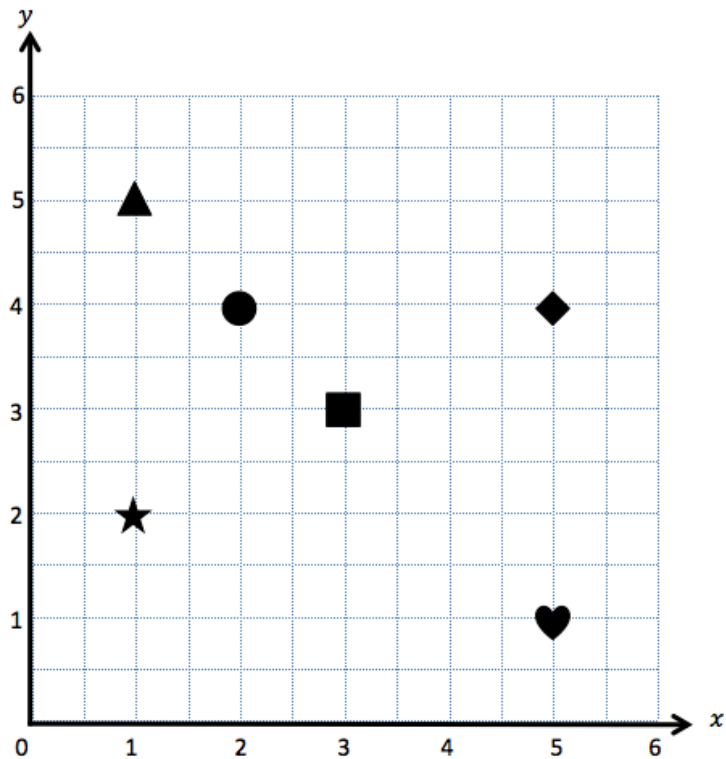
    b.   Choose one of the sets of perpendicular lines above, and create a coordinate plane. Mark 5 units on each axis, and label them as whole numbers.

2.   Use the coordinate plane to answer the following.

    a.   Name the shape at each location.

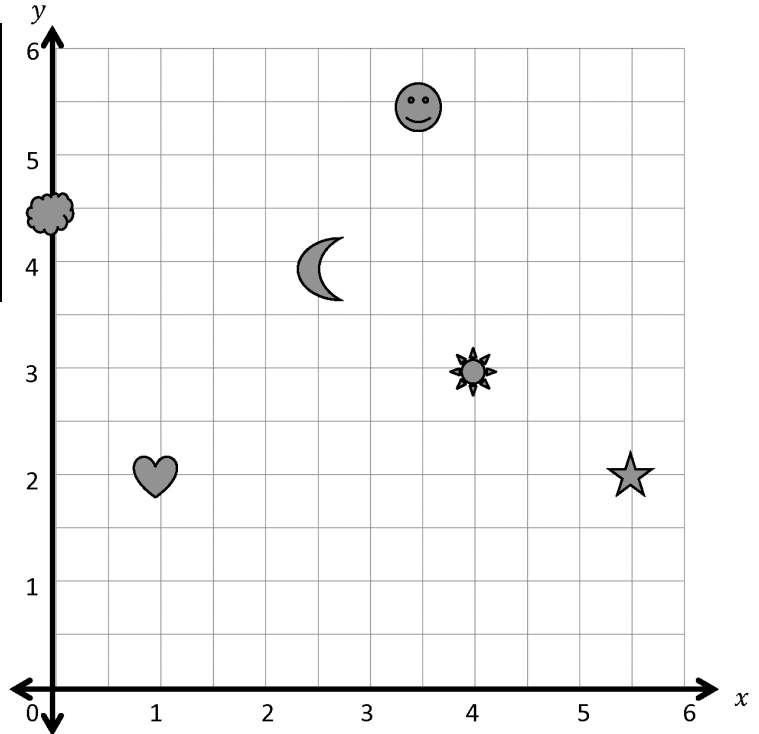| x-coordinate	y-coordinate	Shape
2	4	
5	4	
1	5	
5	1	

    b.   Which shape is 2 units from the x-axis?

    c.   Which shape has the same x- and y-coordinate?

3. Use the coordinate plane to answer the following.

a. Name the coordinates of each shape.

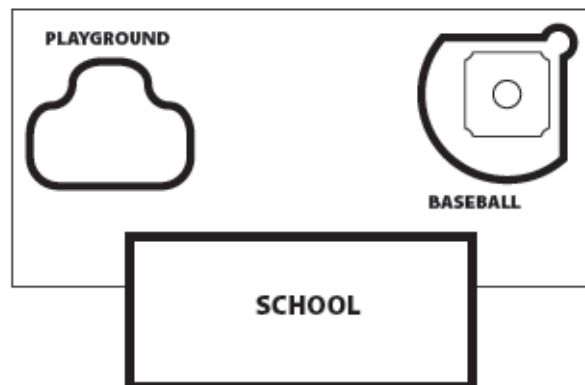| Shape	x-coordinate	y-coordinate
Moon		
Sun		
Heart		
Cloud		
Smiley Face		

b. Which 2 shapes have the same y-coordinate?

c. Plot an X at (2, 3).

d. Plot a square at $(3, 2\frac{1}{2})$.

e. Plot a triangle at $(6, 3\frac{1}{2})$.

4. Mr. Palmer plans to bury a time capsule 10 yards behind the school. What else should he do to make naming the location of the time capsule more accurate?

PLAYGROUND

BASEBALL

SCHOOL

Name _____   Date _____

1. Use the grid below to complete the following tasks.

    a. Construct a y-axis that passes through points Y and Z.

    b. Construct a perpendicular x-axis that passes through points Z and X.

    c. Label the origin as 0.

    d. The y-coordinate of W is $2\frac{3}{5}$. Label the whole numbers along the y-axis.

    e. The x-coordinate of V is $2\frac{2}{5}$. Label the whole numbers along the x-axis.

EUREKA MATH™

Lesson 3: Name points using coordinate pairs, and use the coordinate pairs to plot points.

Modified from original

engage^ny

53

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015
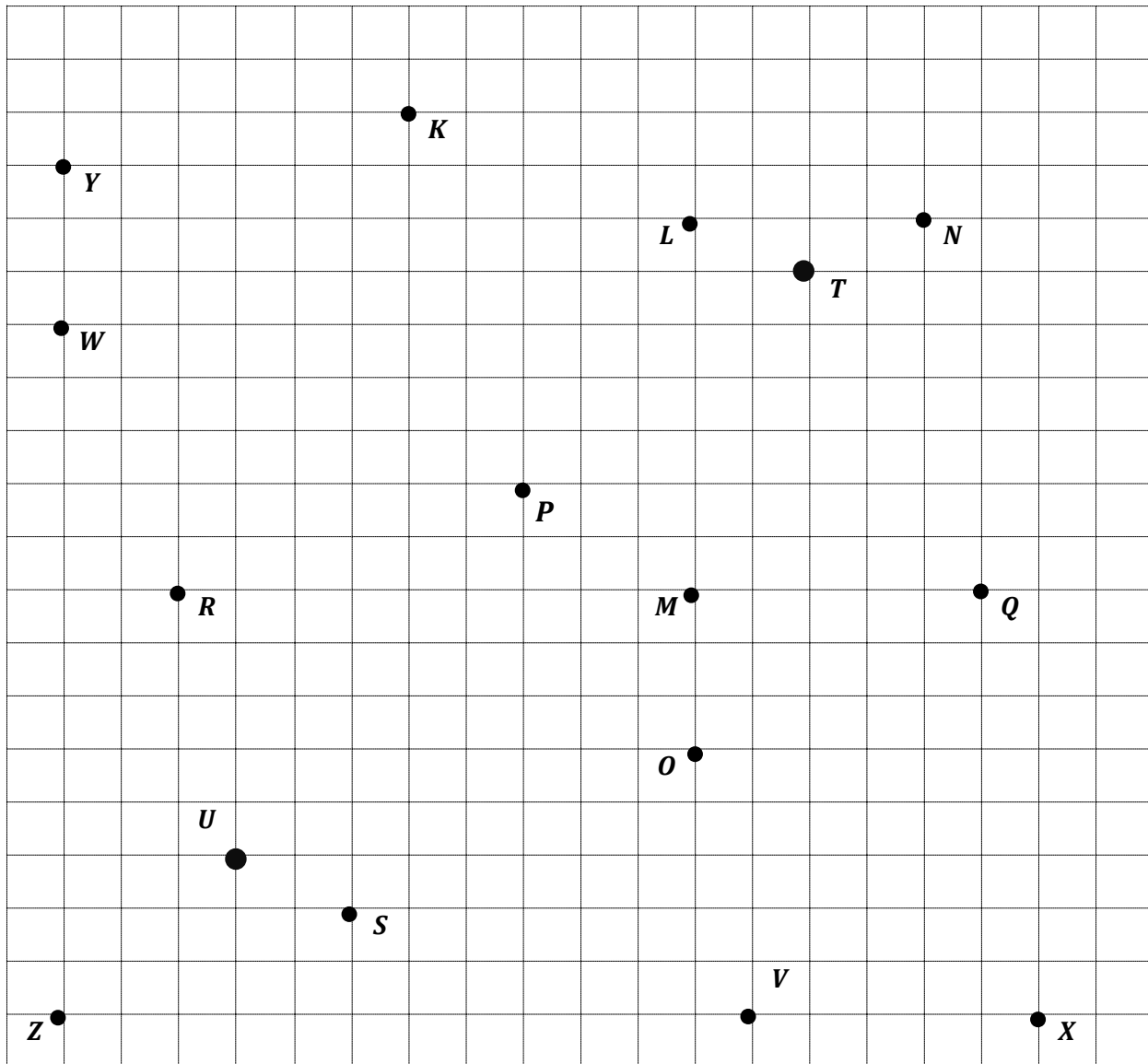
2. For all of the following problems, consider the points K through X on the previous page.

a. Identify all of the points that have a y-coordinate of $1\frac{3}{5}$.

b. Identify all of the points that have an x-coordinate of $2\frac{1}{5}$.

c. Which point is $1\frac{3}{5}$ units above the x-axis *and* $3\frac{1}{5}$ units to the right of the y-axis? Name the point, and give its coordinate pair.

d. Which point is located $1\frac{1}{5}$ units from the y-axis?

e. Which point is located $\frac{2}{5}$ unit along the x-axis?

f. Give the coordinate pair for each of the following points.

T: _____ U: _____ S: _____ K: _____

g. Name the points located at the following coordinates.

$(\frac{3}{5}, \frac{3}{5})$ _____ $(3\frac{2}{5}, 0)$ _____ $(2\frac{1}{5}, 3)$ _____ $(0, 2\frac{3}{5})$ _____

h. Plot a point whose x- and y-coordinates are equal. Label your point E.

i. What is the name for the point on the plane where the two axes intersect? _____
   Give the coordinates for this point. (_____ , _____)

j. Plot the following points.

A: $(1\frac{1}{5}, 1)$ B: $(\frac{1}{5}, 3)$ C: $(2\frac{4}{5}, 2\frac{2}{5})$ D: $(1\frac{1}{5}, 0)$

k. What is the distance between L and N, or LN?

EUREKA MATH™

Lesson 3:   Name points using coordinate pairs, and use the coordinate pairs to plot points.

engage^ny   54

l.   What is the distance of MQ?

m.   Would RM be greater than, less than, or equal to $LN + MQ$?

n.   Leslie was explaining how to plot points on the coordinate plane to a new student, but she left off some important information. Correct her explanation so that it is complete.

"All you have to do is read the coordinates; for example, if it says (4, 7), count four, then seven, and put a point where the two grid lines intersect."

Lesson 3:   Name points using coordinate pairs, and use the coordinate pairs to plot points.

engage^ny

55

Modified from original
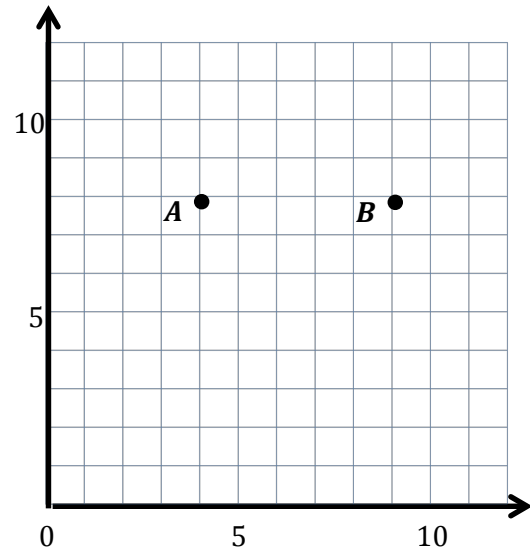
Name _____   Date _____

1. Use the coordinate plane to answer the questions.

   a. Use a straightedge to construct a line that goes through points A and B. Label the line g.

   b. Line g is parallel to the _____-axis and is perpendicular to the _____-axis.

   c. Draw two more points on line g. Name them C and D.

   d. Give the coordinates of each point below.

   A: _____ B: _____

   C: _____ D: _____

   e. What do all of the points on line g have in common?

   f. Give the coordinates of another point that falls on line g with an x-coordinate greater than 25.

EUREKA MATH™

Lesson 5: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny

79

Modified from original

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

BY-NC-SA This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

2. Plot the following points on the coordinate plane to the right.

H: ($\frac{3}{4}$, 3) I: ($\frac{3}{4}$, 2$\frac{1}{4}$)

J: ($\frac{3}{4}$, $\frac{1}{2}$) K: ($\frac{3}{4}$, 1$\frac{3}{4}$)

a. Use a straightedge to draw a line to connect these points. Label the line f.

b. In line f, x = _____ for all values of y.

c. Circle the correct word:
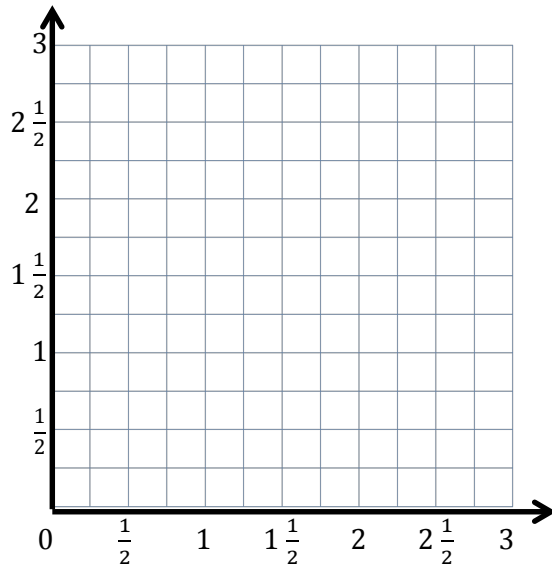
Line f is *parallel*   *perpendicular* to the x-axis.

Line f is *parallel*   *perpendicular* to the y-axis.

d. What pattern occurs in the coordinate pairs that make line f vertical?

3. For each pair of points below, think about the line that joins them. For which pairs is the line parallel to the x-axis? Circle your answer(s). Without plotting them, explain how you know.

a. (3.2, 7) and (5, 7)   b. (8, 8.4) and (8, 8.8)   c. ($6\frac{1}{2}$, 12) and (6.2, 11)

4. For each pair of points below, think about the line that joins them. For which pairs is the line parallel to the y-axis? Circle your answer(s). Then, give 2 other coordinate pairs that would also fall on this line.

a. (3.2, 8.5) and (3.22, 24)   b. ($13\frac{1}{3}$, $4\frac{2}{3}$) and ($13\frac{1}{3}$, 7)   c. (2.9, 5.4) and (7.2, 5.4)

EUREKA MATH™

Lesson 5:   Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny   80

5. Write the coordinate pairs of 3 points that can be connected to construct a line that is $5\frac{1}{2}$ units to the right of and parallel to the y-axis.

   a. _____   b. _____   c. _____

6. Write the coordinate pairs of 3 points that lie on the y-axis.

   a. _____   b. _____   c. _____

7. Leslie and Peggy are playing Battleship on axes labeled in halves. Presented in the table is a record of Peggy's guesses so far. What should she guess next? How do you know? Explain using words and pictures.

(5, 5)	miss
(4, 5)	hit
$(3\frac{1}{2}, 5)$	miss
$(4\frac{1}{2}, 5)$	miss

EUREKA MATH™

Lesson 5: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny

81

Name _____   Date _____
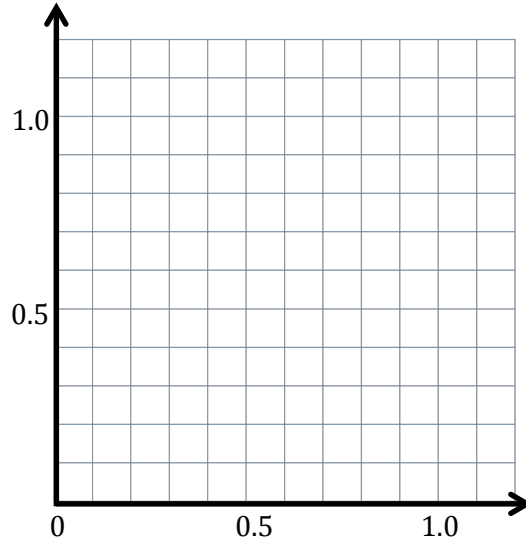
1. Plot and label the following points on the coordinate plane.

    C: (0.4, 0.4) A: (1.1, 0.4) S: (0.9, 0.5) T: (0.9, 1.1)

    a. Use a straightedge to construct line segments $\overline{CA}$ and $\overline{ST}$.

    b. Name the line segment that is perpendicular to the x-axis and parallel to the y-axis.
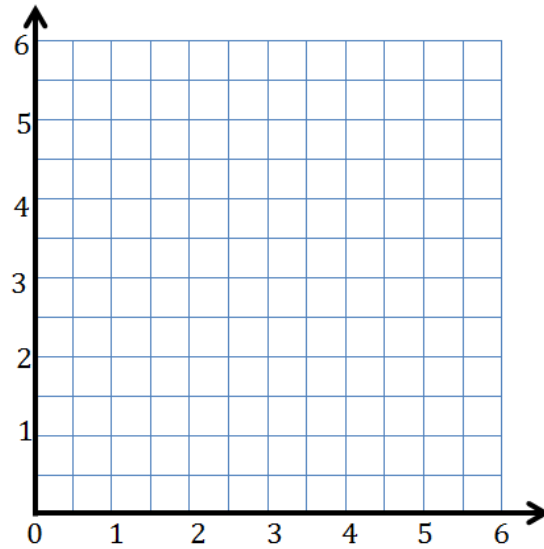   _____

    c. Name the line segment that is parallel to the x-axis and perpendicular to the y-axis.
        _____

    d. Plot a point on $\overline{CA}$, and name it E. Plot a point on line segment $\overline{ST}$, and name it R.

    e. Write the coordinates of points E and R.

        E (_____ , _____) R (_____ , _____)

EUREKA MATH

Lesson 6: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.
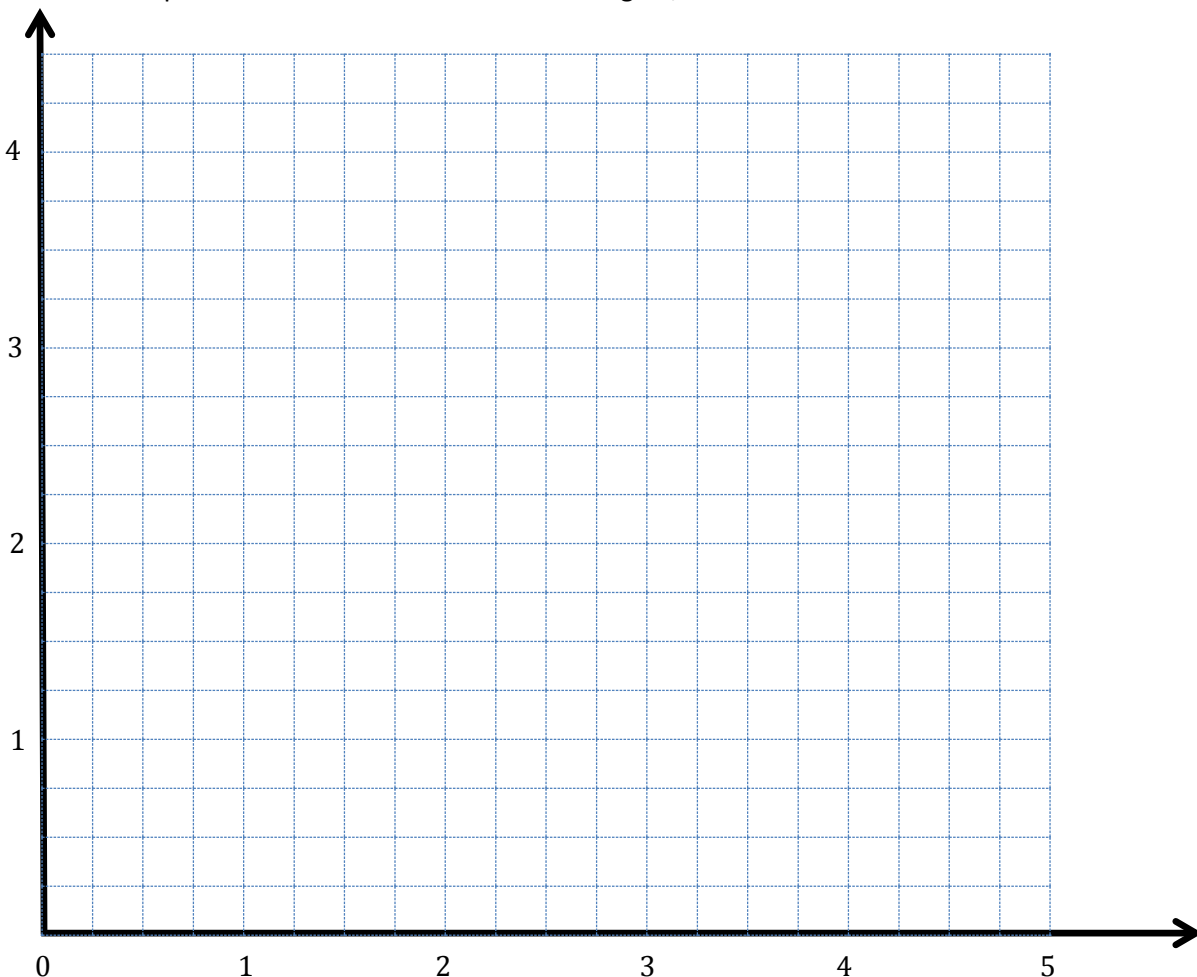
Modified from original

engageny

94

2. Construct line m such that the y-coordinate of every point is $1\frac{1}{2}$, and construct line n such that the x-coordinate of every point is $5\frac{1}{2}$.

a. Line m is _____ units from the x-axis.

b. Give the coordinates of the point on line m that is 2 units from the y-axis. _____

c. With a blue pencil, shade the portion of the grid that is less than $1\frac{1}{2}$ units from the x-axis.

d. Line n is _____ units from the y-axis.

e. Give the coordinates of the point on line n that is $3\frac{1}{2}$ units from the x-axis.

f. With a red pencil, shade the portion of the grid that is less than $5\frac{1}{2}$ units from the y-axis.

EUREKA MATH™

Lesson 6: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^ny

95

Modified from original

3. Construct and label lines e, r, s, and o on the plane below.

    a. Line e is 3.75 units above the x-axis.

    b. Line r is 2.5 units from the y-axis.

    c. Line s is parallel to line e but 0.75 farther from the x-axis.

    d. Line o is perpendicular to lines s and e and passes through the point $(3\frac{1}{4}, 3\frac{1}{4})$.

4. Complete the following tasks on the plane.

    a. Using a blue pencil, shade the region that contains points that are more than $2\frac{1}{2}$ units and less than $3\frac{1}{4}$ units from the y-axis.

    b. Using a red pencil, shade the region that contains points that are more than $3\frac{3}{4}$ units and less than $4\frac{1}{2}$ units from the x-axis.

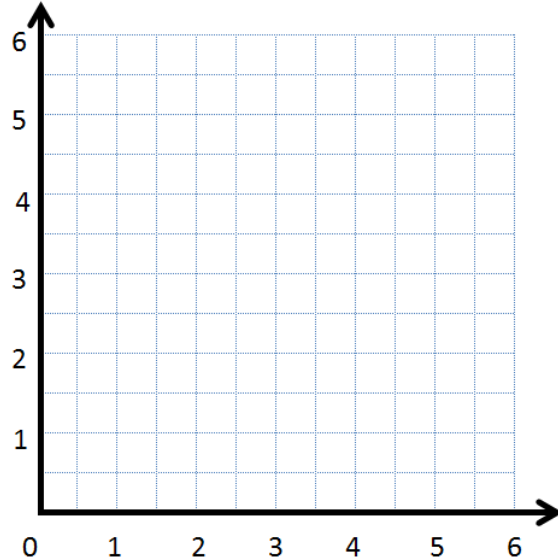   c. Plot a point that lies in the double-shaded region, and label its coordinates.

EUREKA MATH™

Lesson 6: Investigate patterns in vertical and horizontal lines, and interpret points on the plane as distances from the axes.

engage^{ny}

96

Modified from original

Name _____   Date _____

1. Complete the chart. Then, plot the points on the coordinate plane.

x	y	(x, y)
2	0	
$3\frac{1}{2}$	$1\frac{1}{2}$	
$4\frac{1}{2}$	$2\frac{1}{2}$	
6	4	

a. Use a straightedge to draw a line connecting these points.

b. Write a rule showing the relationship between the x- and y-coordinates of points on this line.

c. Name two other points that are also on this line.   _____   _____

2. Complete the chart. Then, plot the points on the coordinate plane.

x	y	(x, y)
0	0	
$\frac{1}{4}$	$\frac{3}{4}$	
$\frac{1}{2}$	$1\frac{1}{2}$	
1	3	
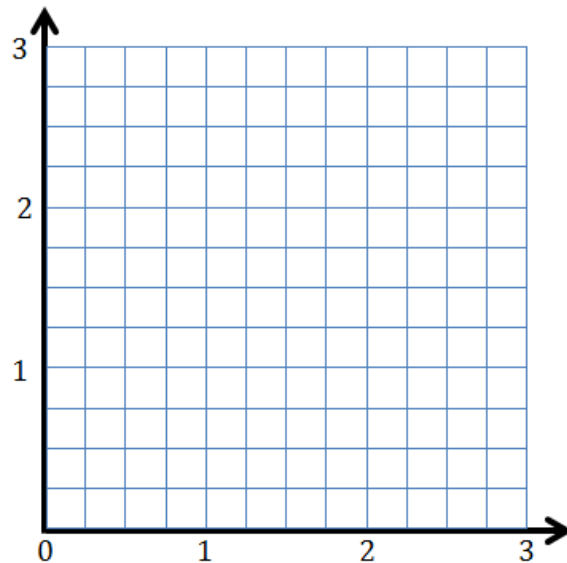
a. Use a straightedge to draw a line connecting these points.

b. Write a rule showing the relationship between the x- and y-coordinates for points on the line.

c. Name two other points that are also on this line.   _____   _____

EUREKA MATH™

Lesson 7:   Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.

engage^{ny}

112

Modified from original

3. Use the coordinate plane to answer the following questions.

   a. For any point on line m, the x-coordinate is

      _____.

   b. Give the coordinates for 3 points that are on line n.

   c. Write a rule that describes the relationship between the x- and y-coordinates on line n.
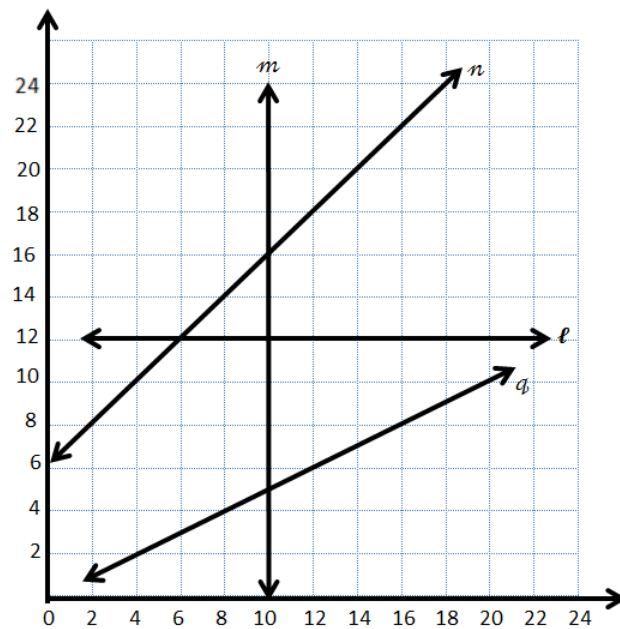
   d. Give the coordinates for 3 points that are on line q.

   e. Write a rule that describes the relationship between the x- and y-coordinates on line q.

   f. Identify a line on which each of these points lie.

      i. (10, 3.2) _____   ii. (12.4, 18.4) _____

      iii. (6.45, 12) _____   iv. (14, 7) _____

EUREKA MATH

Lesson 7: Plot points, use them to draw lines in the plane, and describe patterns within the coordinate pairs.

engage^{ny}

113

Name _____   Date _____
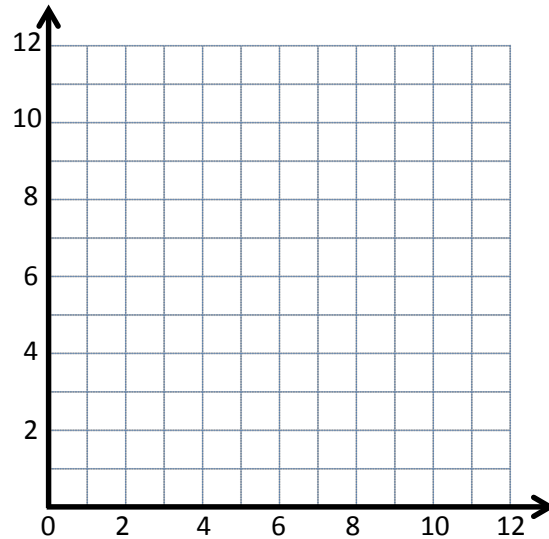
1. Complete this table such that each y-coordinate is 4 more than the corresponding x-coordinate.

x	y	(x, y)

a. Plot each point on the coordinate plane.

b. Use a straightedge to construct a line connecting these points.

c. Give the coordinates of 2 other points that fall on this line with x-coordinates greater than 18.
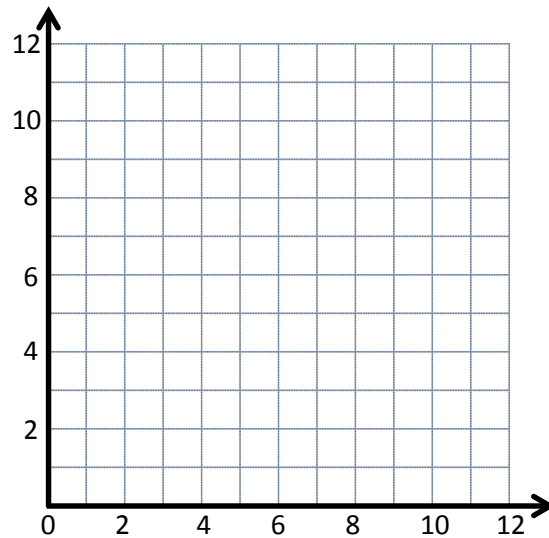
(_____ , _____) and (_____ , _____)

2. Complete this table such that each y-coordinate is 2 times as much as its corresponding x-coordinate.

x	y	(x, y)

a. Plot each point on the coordinate plane.

b. Use a straightedge to draw a line connecting these points.

c. Give the coordinates of 2 other points that fall on this line with y-coordinates greater than 25.

(_____ , _____) and (_____ , _____)

EUREKA MATH™

Lesson 8:   Generate a number pattern from a given rule, and plot the points.

engage^ny

3. Use the coordinate plane below to complete the following tasks.

    a. Graph these lines on the plane.
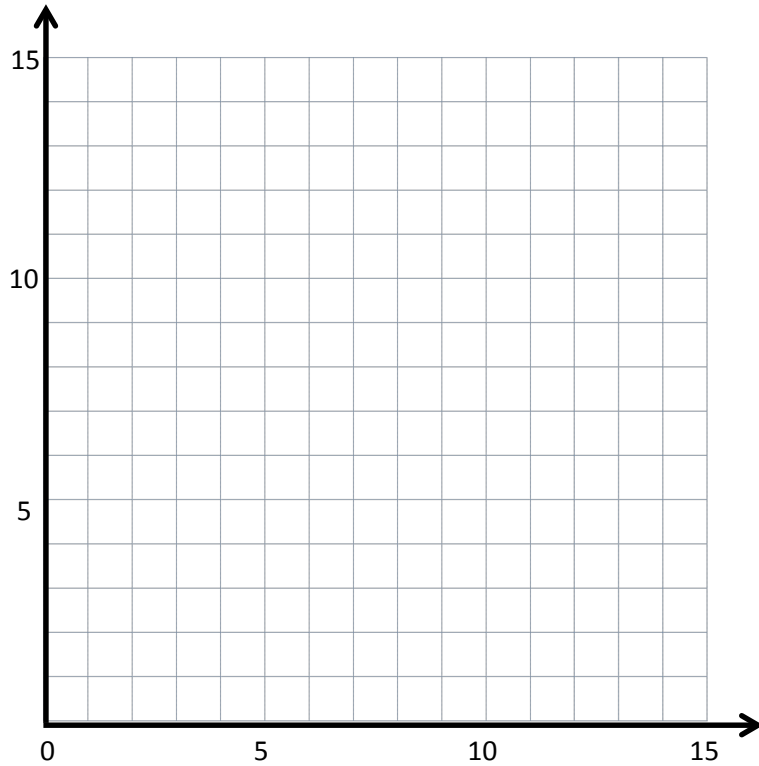
        line ℓ: x is equal to y

	x	y	(x, y)
A			
B			
C			

        line m: y is 1 less than x

	x	y	(x, y)
G			
H			
I			

        line n: y is 1 less than twice x

	x	y	(x, y)
S			
T			
U			

    b. Do any of these lines intersect? If yes, identify which ones, and give the coordinates of their intersection.

    c. Are any of these lines parallel? If yes, identify which ones.

    d. Give the rule for another line that would be parallel to the lines you listed in Problem 3(c).

EUREKA
MATH

Lesson 8:   Generate a number pattern from a given rule, and plot the points.

engage^ny   131

Name _____   Date _____

1. Complete the table for the given rules.

Line a

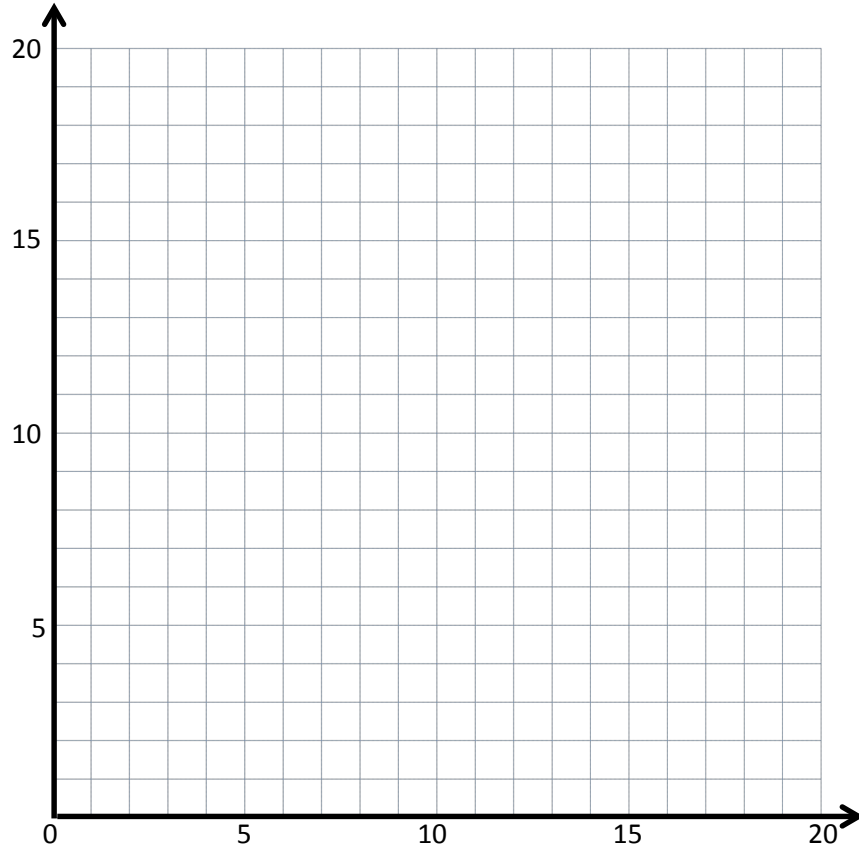*Rule: y is 1 less than x*

x	y	(x, y)
1		
4		
9		
16		

Line b

Rule: y is 5 less than x

x	y	(x, y)
5		
8		
14		
20		

a. Construct each line on the coordinate plane.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what line c, whose rule is y is 7 less than x, would look like. Draw your prediction on the plane above.

Generate two number patterns from given rules, plot the points, and analyze the patterns.

engage^{ny}

2. Complete the table for the given rules.

Line *e*
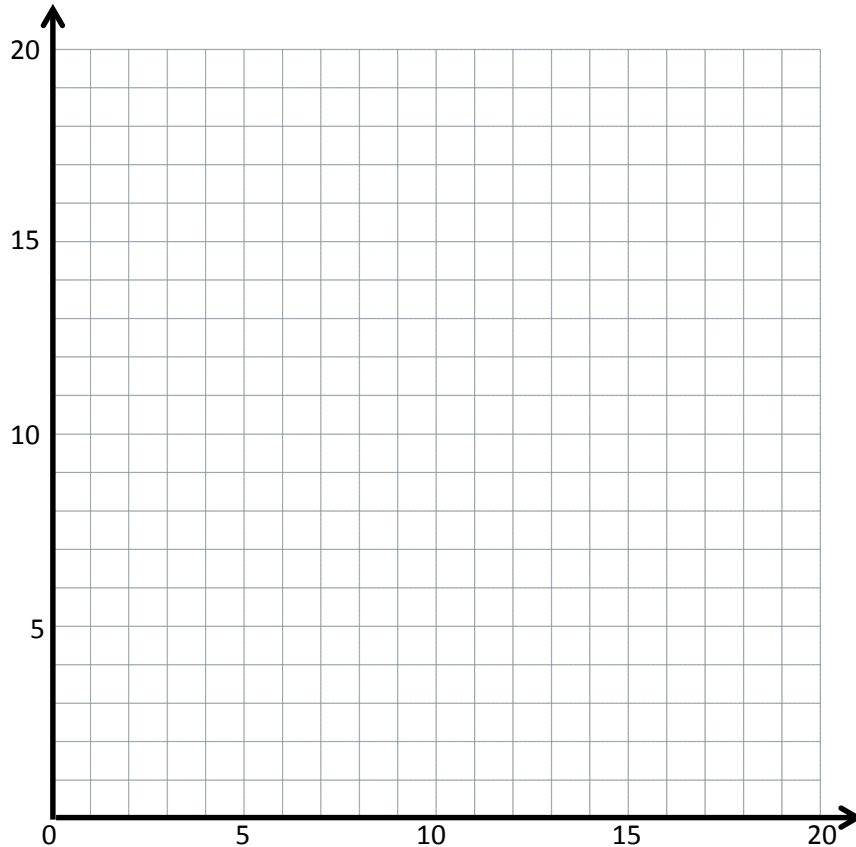
Rule: y is 3 times as much as x

x	*y*	*(x, y)*
0		
1		
4		
6		

Line *f*

Rule: y is a third as much as x

| *x*	*y*	*(x, y)*
0		
3		
9		
15		

a. Construct each line on the coordinate plane.

b. Compare and contrast these lines.

c. Based on the patterns you see, predict what line *g*, whose rule is *y is 4 times as much as x*, and line *h*, whose rule is *y is one-fourth as much as x*, would look like. Draw your prediction in the plane above.

Modified from original

Name _____ Date _____

1. Use the coordinate plane to complete the following tasks.

    a. Line p represents the rule *x and y are equal*.

    b. Construct a line, d, that is parallel to line p and contains point D.

    c. Name 3 coordinate pairs on line d.

    d. Identify a rule to describe line d.

    e. Construct a line, e, that is parallel to line p and contains point E.

    f. Name 3 points on line e.

    g. Identify a rule to describe line e.

    h. Compare and contrast lines d and e in terms of their relationship to line p.
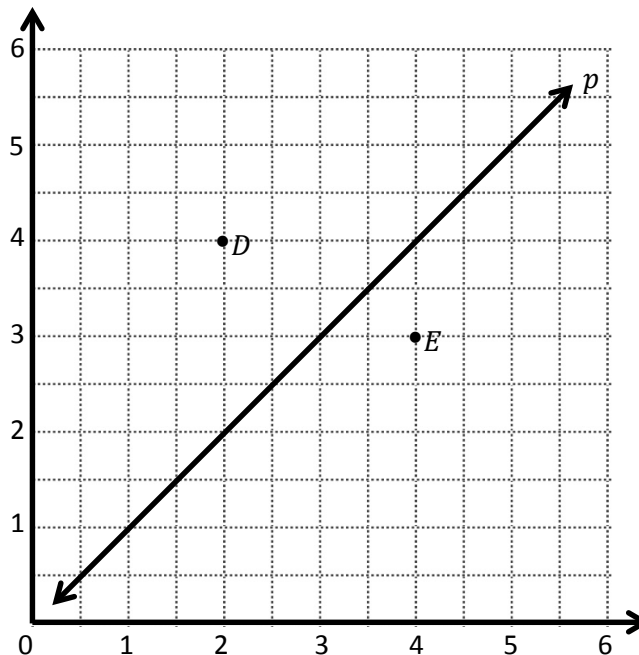
2. Write a rule for a fourth line that would be parallel to those above and that would contain the point $(5\frac{1}{2}, 2)$. Explain how you know.
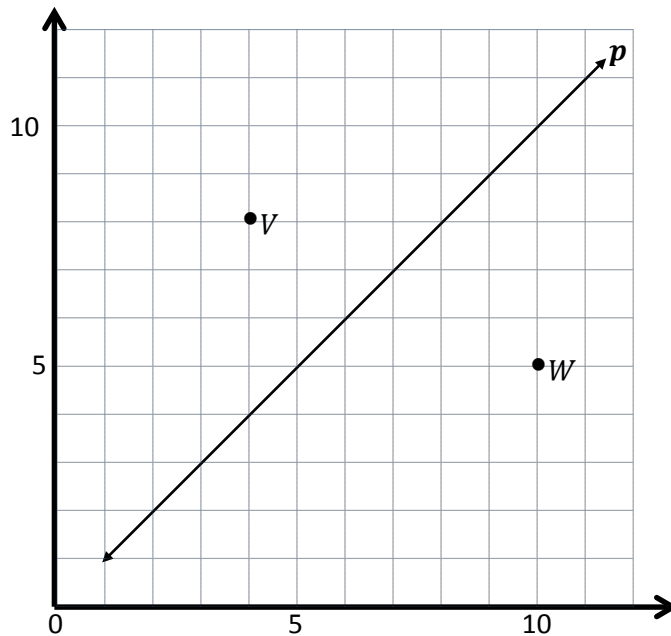
3. Use the coordinate plane below to complete the following tasks.

    a. Line p represents the rule x *and* y *are equal*.

    b. Construct a line, v, that contains the origin and point V.

    c. Name 3 points on line v.

    d. Identify a rule to describe line v.

    e. Construct a line, w, that contains the origin and point W.

    f. Name 3 points on line w.
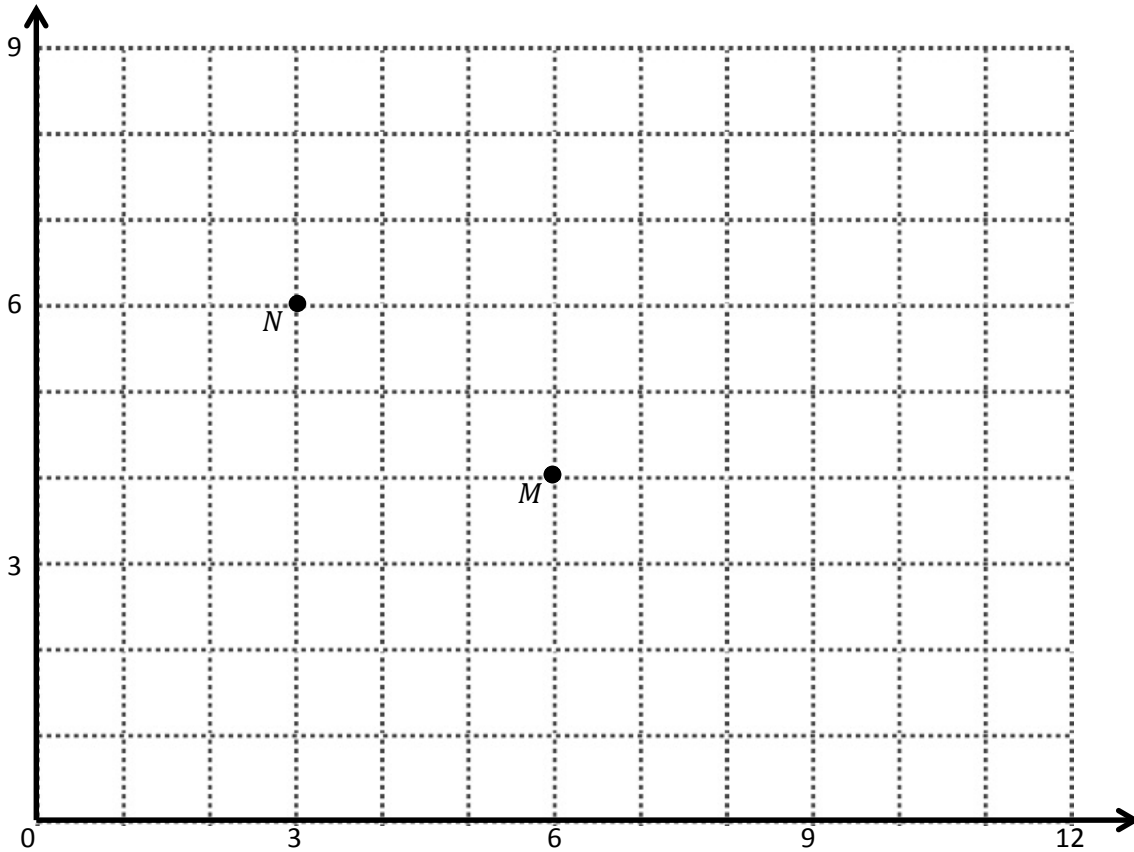
    g. Identify a rule to describe line w.

    h. Compare and contrast lines v and w in terms of their relationship to line p.

    i. What patterns do you see in lines that are generated by multiplication rules?

EUREKA MATH™

Lesson 10 | Compare the lines and patterns generated by addition rules and multiplicative rules.

engage^ny

159

Modified from original

Name _____   Date _____

1. Use the coordinate plane below to complete the following tasks.

a. Identify the locations of M and N. M: (_____, _____) N: (_____, _____)

b. Draw $\overleftrightarrow{MN}$.

c. Plot the following coordinate pairs on the plane.

$$J: (5, 7) \qquad K: (8, 5)$$

d. Draw $\overleftrightarrow{JK}$.

e. Circle the relationship between $\overleftrightarrow{MN}$ and $\overleftrightarrow{JK}$. $\overleftrightarrow{MN} \perp \overleftrightarrow{JK}$ $\overleftrightarrow{MN} \parallel \overleftrightarrow{JK}$
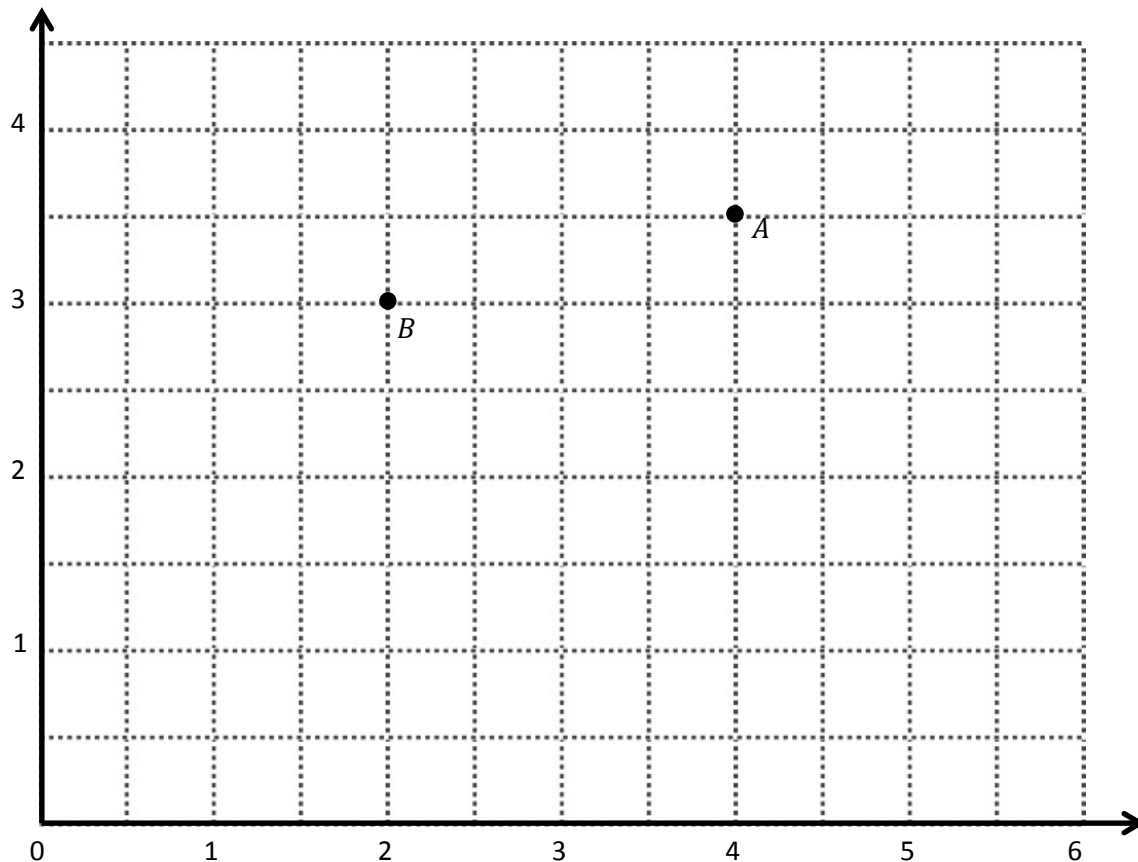
f. Give the coordinates of a pair of points, F and G, such that $\overleftrightarrow{FG} \parallel \overleftrightarrow{MN}$.

$$F: (\_\_\_\_, \_\_\_\_) \qquad G: (\_\_\_\_, \_\_\_\_)$$

g. Draw $\overleftrightarrow{FG}$.

EUREKA MATH™

Lesson 14:   Construct parallel line segments, and analyze relationships of the coordinate pairs.

engage^{ny}

© 2015 Great Minds. eureka-math.org
G5-M6-TE-1.3.0-09.2015

Modified from original

2. Use the coordinate plane below to complete the following tasks.

a. Identify the locations of A and B. A: (_____, _____) B: (_____, _____)

b. Draw $\overleftrightarrow{AB}$.

c. Generate coordinate pairs for C and D, such that $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$.

C: (_____, _____) D: (_____, _____)

d. Draw $\overleftrightarrow{CD}$.

e. Explain the pattern you used when generating coordinate pairs for C and D.

f. Give the coordinates of a point, F, such that $\overleftrightarrow{AB} \parallel \overleftrightarrow{EF}$.
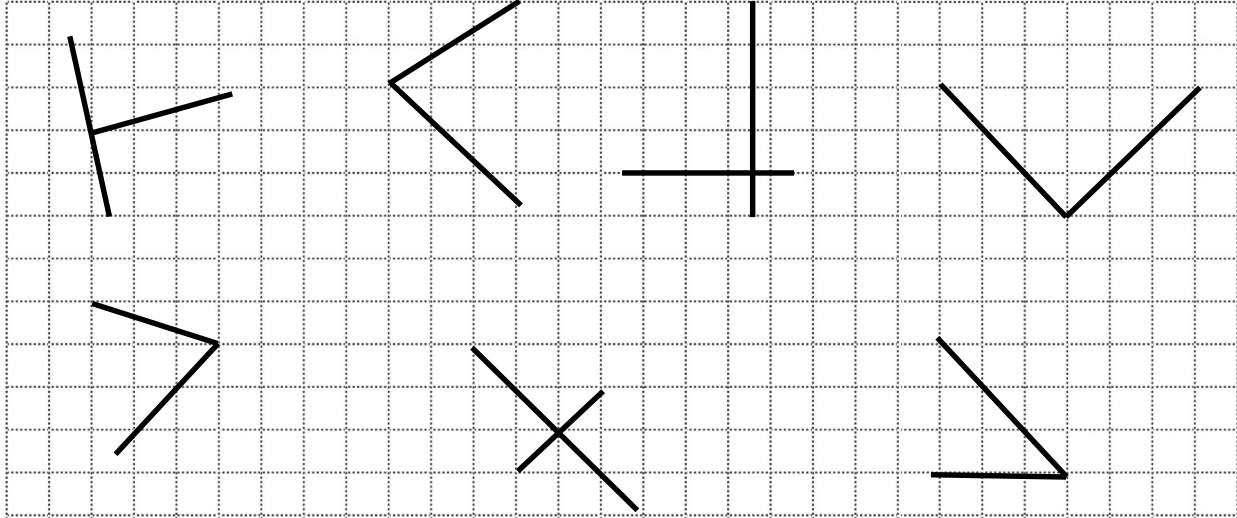
E: $(2\frac{1}{2}, 2\frac{1}{2})$ F: (_____, _____)

g. Explain how you chose the coordinates for F.

EUREKA MATH™

Lesson 14: Construct parallel line segments, and analyze relationships of the coordinate pairs.

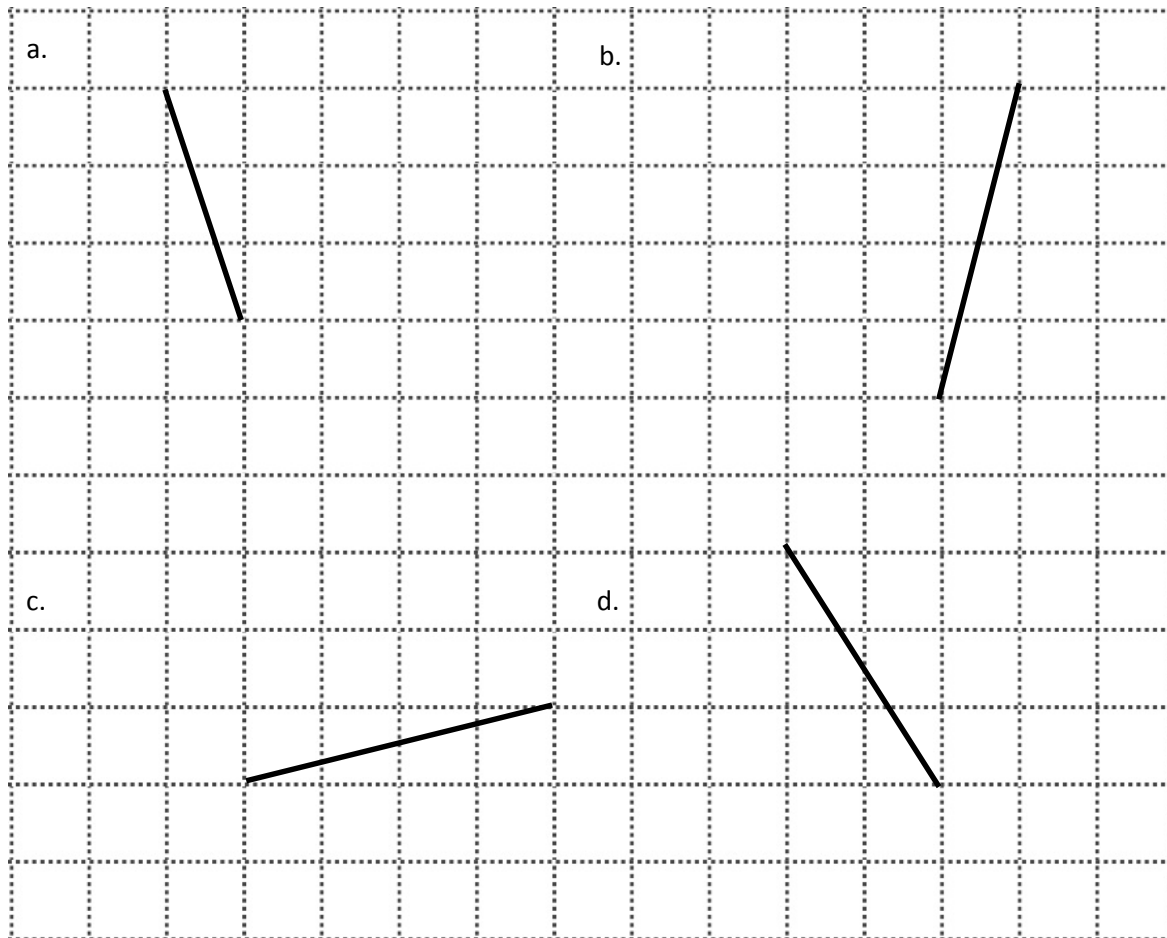engage^ny

229

Modified from original

Name _____   Date _____

1. Circle the pairs of segments that are perpendicular.

2. In the space below, use your right triangle templates to draw at least 3 different sets of perpendicular lines.

Lesson 15:   Construct perpendicular line segments on a rectangular grid.

engage^ny   **240**

3. Draw a segment perpendicular to each given segment. Show your thinking by sketching triangles as needed.

    a.

    b.

    c.

    d.

4. Draw 2 different lines perpendicular to line b.

    b

Modified from original