

## Lesson 10 Practice Problems

### Problem 1

There is a closed carton of eggs in Mai's refrigerator. The carton contains  $e$  eggs and it can hold 12 eggs.

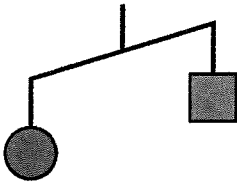
- What does the inequality  $e < 12$  mean in this context?
- What does the inequality  $e > 0$  mean in this context?
- What are some possible values of  $e$  that will make both  $e < 12$  and  $e > 0$  true?

### Possible Solutions

- There are *fewer* than 12 eggs in the carton; the carton is not full.
- There are *more* than 0 eggs in the carton; the carton is not empty.
- There could be as few as 1 egg or as many as 11 eggs in the carton: any whole number of eggs from 1 up to 11.

### Problem 2

Here is a diagram of an unbalanced hanger.



- Write an inequality to represent the relationship of the weights. Use  $s$  to represent the weight of the square in grams and  $c$  to represent the weight of the circle in grams.
- One red circle weighs 12 grams. Write an inequality to represent the weight of one blue square.
- Could 0 be a value of  $s$ ? Explain your reasoning.

### Possible Solutions

- $s < c$
- $s < 12$
- No, 0 could not be a value of  $s$  because the square represents an object. It must have some weight, even if it is very small.

## Lesson 10 Practice Problems

### Problem 3

Tyler has more than \$10. Elena has more money than Tyler. Mai has more money than Elena. Let  $t$  be the amount of money that Tyler has, let  $e$  be the amount of money that Elena has, and let  $m$  be the amount of money that Mai has. Select **all** statements that are true:

- A.  $t < j$
- B.  $m > 10$
- C.  $e > 10$
- D.  $t > 10$
- E.  $e > m$
- F.  $t < e$

### Possible Solutions

A, B, C, F

### Problem 4

From Grade 6, Unit 7, Lesson 8

- a. Jada is taller than Diego. Diego is 54 inches tall (4 feet, 6 inches). Write an inequality that compares Jada's height in inches,  $j$ , to Diego's height.
- b. Jada is shorter than Elena. Elena is 5 feet tall. Write an inequality that compares Jada's height in inches,  $j$ , to Elena's height.

### Possible Solutions

- a.  $j > 54$
- b.  $j < 60$

### Problem 5

From Grade 6, Unit 7, Lesson 3

Which is greater,  $\frac{-9}{20}$  or  $-0.5$ ? Explain how you know. If you get stuck, consider plotting the numbers on a number line.

**Possible Solutions**

$\frac{-9}{20}$  is larger. Explanations vary. Sample explanation:  $\frac{-9}{20} = -0.45$ , and this is to the right of  $-0.5$  on the number line. So,  $\frac{-9}{20}$  is larger.

**Problem 6**

From Grade 6, Unit 6, Lesson 13

Select **all** the expressions that are equivalent to  $\left(\frac{1}{2}\right)^3$ .

A.  $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$

B.  $\frac{1}{2^3}$

C.  $\left(\frac{1}{3}\right)^2$

D.  $\frac{1}{6}$

E.  $\frac{1}{8}$

**Possible Solutions**

A, B, E

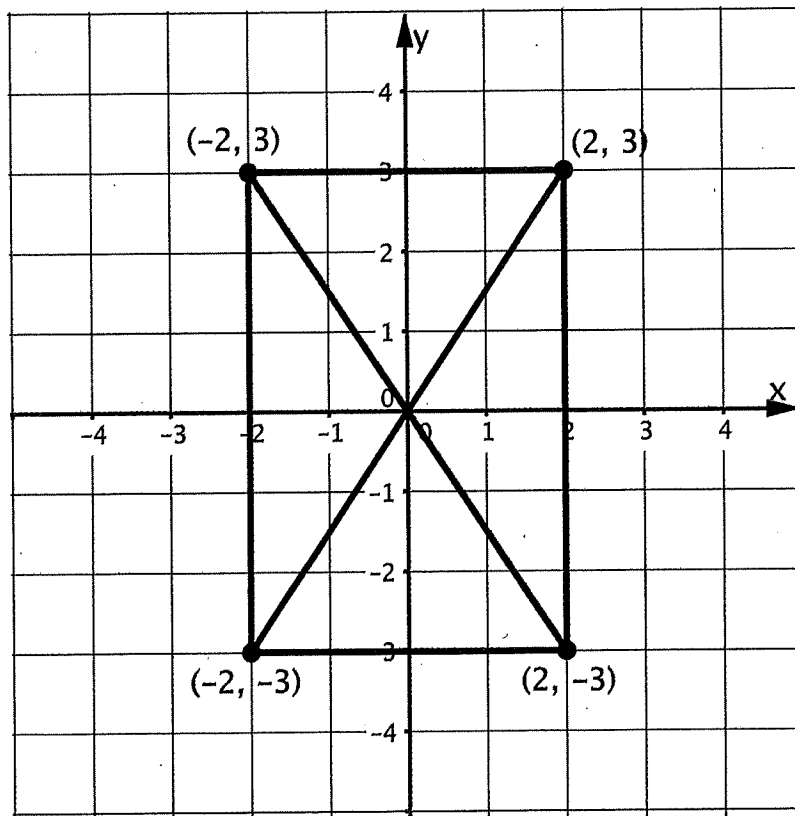
## Lesson 11 Practice Problems

### Problem 1

- Graph these points in a coordinate plane:  $(-2, 3)$ ,  $(2, 3)$ ,  $(-2, -3)$ ,  $(2, -3)$ .
- Connect all of the points. Describe the figure.

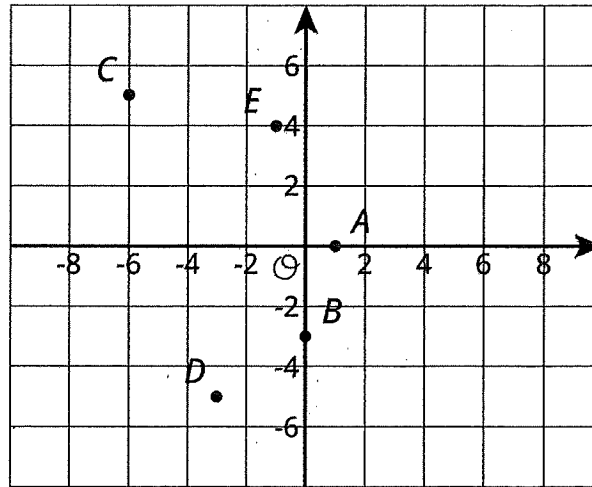
### Possible Solutions

- The points  $A = (-2, 3)$ ,  $B = (2, 3)$ ,  $C = (-2, -3)$ ,  $D = (2, -3)$  are shown on a coordinate plane with segments between them.
- Graph



**Problem 2**

Write the coordinates of each point.

**Possible Solutions**

$A = (1, 0)$ ,  $B = (0, -3)$ ,  $C = (-6, 5)$ ,  $D = (-3, -5)$ ,  $E = (-1, 4)$

**Problem 3**

These three points form a horizontal line:  $(-3.5, 4)$ ,  $(0, 4)$ , and  $(6.2, 4)$ . Name two additional points that fall on this line.

**Possible Solutions**

Answers vary. Any answer that has a  $y$ -coordinate of 4 is on the line.

**Problem 4**

From Grade 6, Unit 7, Lesson 2

One night, it is  $24^{\circ}\text{C}$  warmer in Tucson than it was in Minneapolis. If the temperatures in Tucson and Minneapolis are opposites, what is the temperature in Tucson?

- A.  $-24^{\circ}\text{C}$
- B.  $-12^{\circ}\text{C}$
- C.  $12^{\circ}\text{C}$
- D.  $24^{\circ}\text{C}$

## Lesson 11 Practice Problems

### Possible Solutions

C

#### Problem 5

From Grade 6, Unit 6, Lesson 16

Noah is helping his band sell boxes of chocolate to fund a field trip. Each box contains 20 bars and each bar sells for \$1.50.

- a. Complete the table for values of  $m$ .

boxes sold ( $b$ )	money collected ( $m$ )
1	
2	
3	
4	
5	
6	
7	
8	

- b. Write an equation for the amount of money,  $m$ , that will be collected if  $b$  boxes of chocolate bars are sold. Which is the independent variable and which is the dependent variable in your equation?
- c. Write an equation for the number of boxes,  $b$ , that were sold if  $m$  dollars were collected. Which is the independent variable and which is the dependent variable in your equation?

### Possible Solutions

- a. Values for  $m$ : 30, 60, 90, 120, 150, 180, 210, 240
- b.  $m = 30b$ ,  $b$  is independent,  $m$  is dependent
- c.  $b = \frac{m}{30}$ ,  $m$  is independent,  $b$  is dependent

**Problem 6**

From Grade 6, Unit 2, Lesson 9

Lin ran 29 meters in 10 seconds. She ran at a constant speed.

- a. How far did Lin run every second?
- b. At this rate, how far can she run in 1 minute?

**Possible Solutions**

- a. 2.9 meters every second, because  $29 \div 10 = 2.9$ .
- b. 174 meters, because  $(2.9) \cdot 60 = 174$ .

## Lesson 12 Practice Problems

### Problem 1

Draw and label an appropriate pair of axes and plot the points.

$$\left(\frac{1}{5}, \frac{4}{5}\right)$$

$$\left(-\frac{3}{5}, \frac{2}{5}\right)$$

$$\left(-1\frac{1}{5}, -\frac{4}{5}\right)$$

$$\left(\frac{1}{5}, -\frac{3}{5}\right)$$

### Possible Solutions

Answers vary. Check student work to ensure they made reasonable choices about axes and scale that allowed them to clearly plot all the points.

### Problem 2

Diego was asked to plot these points:  $(-50, 0)$ ,  $(150, 100)$ ,  $(200, -100)$ ,  $(350, 50)$ ,  $(-250, 0)$ . What interval could he use for each axis? Explain your reasoning.

### Possible Solutions

Answers vary. Sample response: Use an interval of 50, because all the coordinates involve points that are greater than 50 and multiples of 50.

### Problem 3

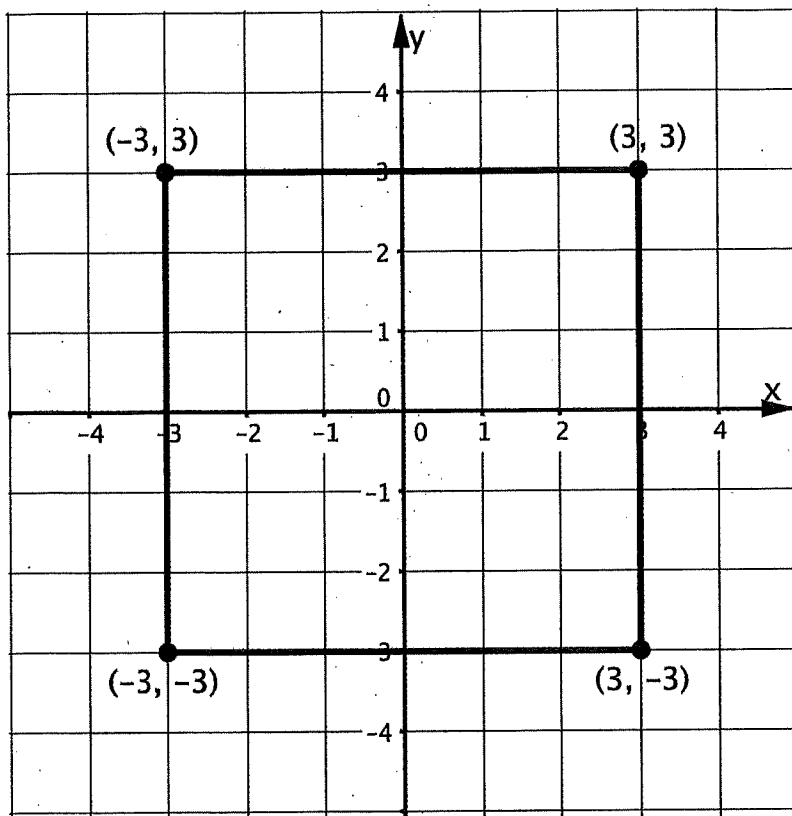
- Name 4 points that would form a square with the origin at its center.
- Graph these points to check if they form a square.

### Possible Solutions

Answers vary. Sample response:  $A = (3, 3)$ ,  $B = (3, -3)$ ,  $C = (-3, 3)$ ,  $D = (-3, -3)$



## Lesson 12 Practice Problems



### Problem 4

From Grade 6, Unit 7, Lesson 5

Which of the following changes would you represent using a negative number? Explain what a positive number would represent in that situation.

- a. A loss of 4 points
- b. A gain of 50 yards
- c. A loss of \$10
- d. An elevation above sea level

### Possible Solutions

Answers vary. Sample response:

1 and 3 can be represented with negative numbers. A loss of 4 points is -4, but if any points are gained, the value becomes positive. A loss of \$10 is -10, but if any money is earned, the value becomes positive.

### Problem 5

From Grade 6, Unit 6, Lesson 16

Jada is buying notebooks for school. The cost of each notebook is \$1.75.

- Write an equation that shows the cost of Jada's notebooks,  $c$ , in terms of the number of notebooks,  $n$ , that she buys.
- Which of the following could be points on the graph of your equation?  
(1.75, 1)      (2, 3.50)      (5, 8.75)      (17.50, 10)      (9, 15.35)

### Possible Solutions

- $c = 1.75n$
- b and c

### Problem 6

From Grade 6, Unit 5, Lesson 13

A corn field has an area of 28.6 acres. It requires about 15,000,000 gallons of water. About how many gallons of water per acre is that?

- 5,000
- 50,000
- 500,000
- 5,000,000

### Possible Solutions

- (15, 00, 000  $\div$  28.6 has a value that is closest to 500,000)

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## Lesson 13 Practice Problems

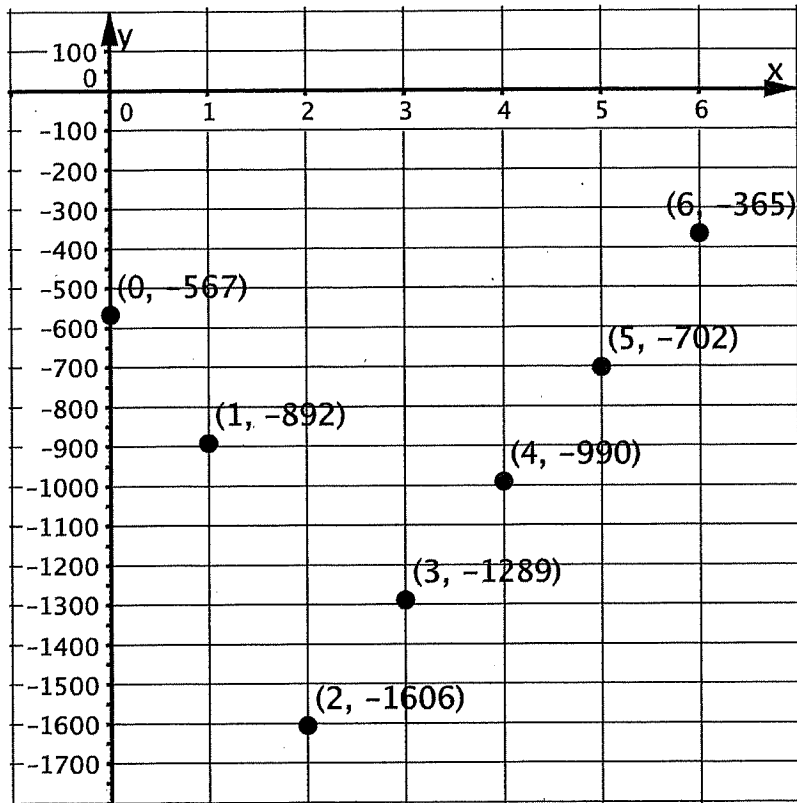
### Problem 1

The elevation of a submarine is shown in the table. Draw and label coordinate axes with an appropriate scale and plot the points.

time after noon (hours)	elevation (meters)
0	-567
1	-892
2	-1,606
3	-1,289
4	-990
5	-702
6	-365

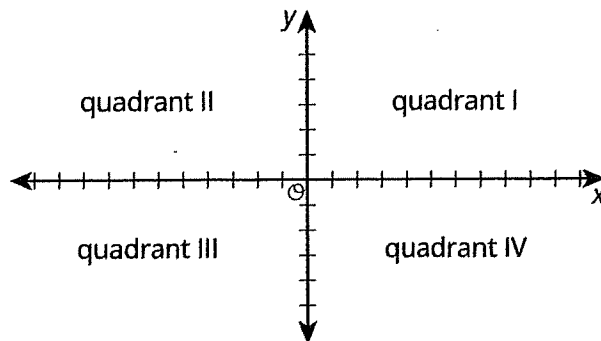
## Lesson 13 Practice Problems

### Possible Solutions



### Problem 2

The  $x$ -axis represents the number of hours before or after noon, and the  $y$ -axis represents the temperature in degrees Celsius.



- At 9 a.m., it was below freezing. In what quadrant would this point be plotted?
- At 11 a.m., it was  $10^{\circ}\text{C}$ . In what quadrant would this point be plotted?
- Choose another time and temperature. Then tell the quadrant where the point should be plotted.
- What does the point  $(0, 0)$  represent in this context?

**Possible Solutions**

- a. Quadrant III
- b. Quadrant II
- c. Answers vary. Sample response: At 11 p.m., the temperature was  $-5^{\circ}\text{C}$ . This point would be plotted in Quadrant IV.
- d. A point at  $(0, 0)$  would represent a freezing temperature ( $0^{\circ}\text{C}$ ) at noon.

**Problem 3**

From Grade 6, Unit 7, Lesson 8

The inequalities  $h > 42$  and  $h < 60$  represent the height requirements for an amusement park ride, where  $h$  represents a person's height in inches.

Write a sentence or draw a sign or that describes these rules as clearly as possible.

**Possible Solutions**

Answers vary. Sample response: To ride, a person must be more than 3 feet 6 inches tall, and no taller than 5 feet.

**Problem 4**

From Grade 6, Unit 6, Lesson 4

Solve each equation.

- a.  $3a = 12$
- b.  $b + 3.3 = 8.9$
- c.  $1 = \frac{1}{4}c$
- d.  $5\frac{1}{2} = d + \frac{1}{4}$
- e.  $2e = 6.4$

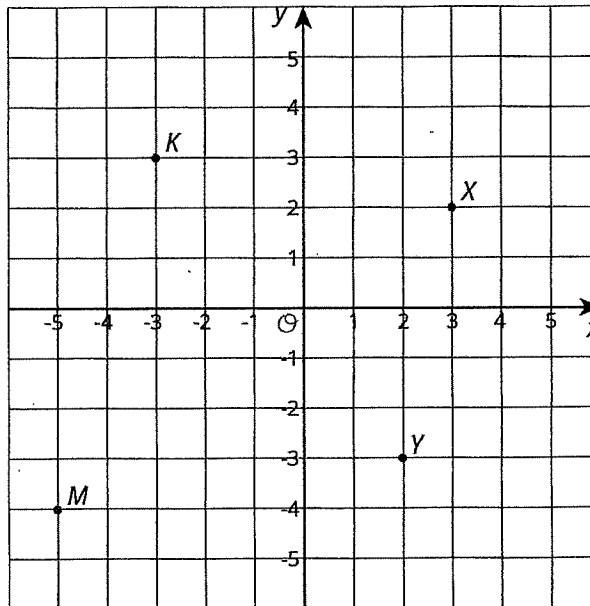
**Possible Solutions**

- a.  $a = 4$
- b.  $b = 5.6$
- c.  $c = 4$
- d.  $d = 5\frac{1}{4}$
- e.  $e = 3.2$

## Lesson 14 Practice Problems

### Problem 1

Here are 4 points on a coordinate plane.



- Label each point with its coordinates.
- Plot a point that is 3 units from point  $K$ . Label it  $P$ .
- Plot a point that is 2 units from point  $M$ . Label it  $W$ .

### Possible Solutions

- $X = (3, 2)$ ,  $Y = (2, -2)$ ,  $K = (-3, 3)$ ,  $M = (-5, -4)$
- Answers vary. Sample responses:  $(0, 3)$  or  $(-3, 6)$
- Answers vary. Sample responses:  $(-3, -4)$  or  $(-5, -2)$

### Problem 2

Each set of points are connected to form a line segment. What is the length of each?

- $A = (3, 5)$  and  $B = (3, 6)$
- $C = (-2, -3)$  and  $D = (-2, -6)$
- $E = (-3, 1)$  and  $F = (-3, -1)$

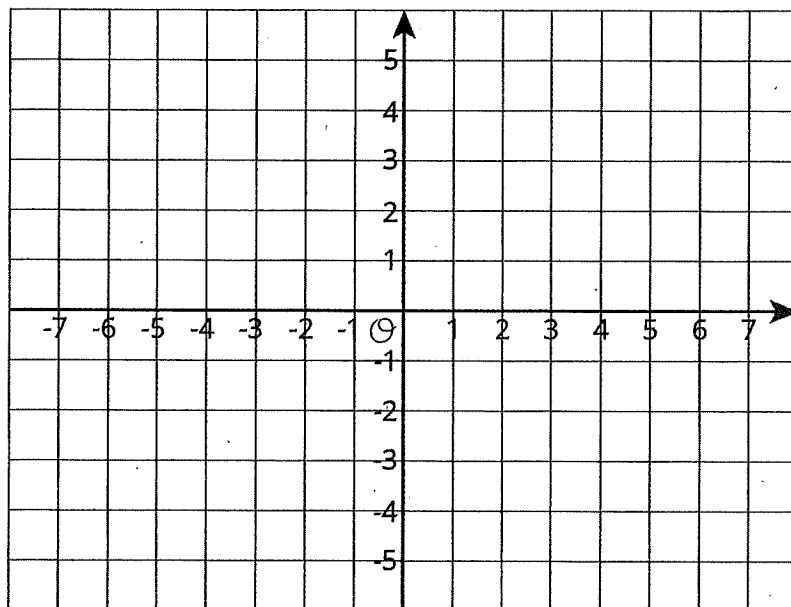
## Lesson 14 Practice Problems

### Possible Solutions

- a. 1 unit
- b. 3 units
- c. 2 units

### Problem 3

On the coordinate plane, plot four points that are each 3 units away from point  $P = (-2, -1)$ . Write the coordinates of each point.



### Possible Solutions

Answers vary. Sample response:  $A = (-5, -1)$ ,  $B = (1, -1)$ ,  $C = (-2, 2)$ ,  $D = (-2, -4)$ . (Students are unlikely to come up with other possible solutions at this stage.)

### Problem 4

From Grade 6, Unit 6, Lesson 16

Noah's recipe for sparkling orange juice uses 4 liters of orange juice and 5 liters of soda water.

- a. Noah prepares large batches of sparkling orange juice for school parties. He usually knows the total number of liters,  $t$ , that he needs to prepare. Write an equation that shows how Noah can find  $s$ , the number of liters of soda water, if he knows  $t$ .
- b. Sometimes the school purchases a certain number,  $j$ , of liters of orange juice and Noah needs to figure out how much sparkling orange juice he can make. Write an equation that Noah can use to find  $t$  if he knows  $j$ .

## Possible Solutions

a.  $s = \frac{5}{9}t$

b.  $t = \frac{9}{4}j$

## Problem 5

From Grade 6, Unit 3, Lesson 4

For a suitcase to be checked on a flight (instead of carried by hand), it can weigh at most 50 pounds. Andre's suitcase weighs 23 kilograms. Can Andre check his suitcase? Explain or show your reasoning. (Note: 10 kilograms  $\approx$  22 pounds)

## Possible Solutions

No, Andre will not be able to check his suitcase if they are strict about following the rule. Possible explanation:

1 kg weighs 2.2 pounds, so 23 kg weighs  $(2.2) \cdot 23 = 50.6$  pounds.

weight (kilograms)	weight (pounds)
10	22
20	44
1	2.2
3	6.6
23	50.6



## Lesson 15 Practice Problems

### Problem 1

The coordinates of a rectangle are  $(3, 0)$ ,  $(3, -5)$ ,  $(-4, 0)$  and  $(-4, -5)$

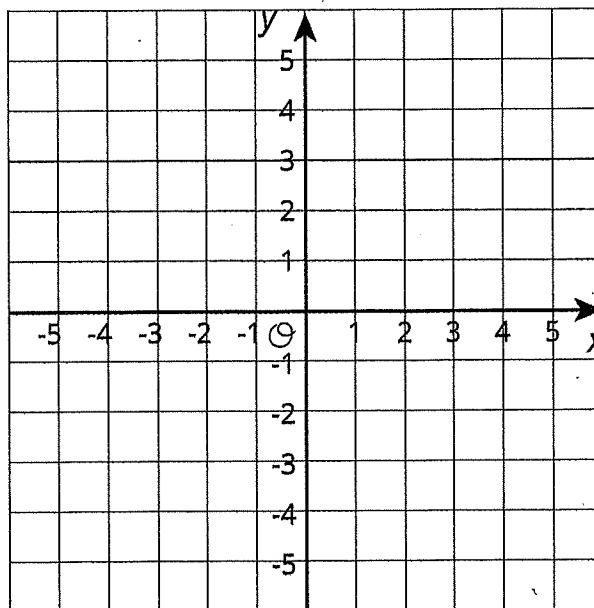
- What is the length and width of this rectangle?
- What is the perimeter of the rectangle?
- What is the area of the rectangle?

### Possible Solutions

- The length is 7 units and the width is 5 units.
- The perimeter is 24 units, because  $7 + 7 + 5 + 5 = 24$ .
- The area is 35 square units, because  $7 \cdot 5 = 35$ .

### Problem 2

Draw a square with one vertex on the origin  $(-3, 5)$  and a perimeter of 20.



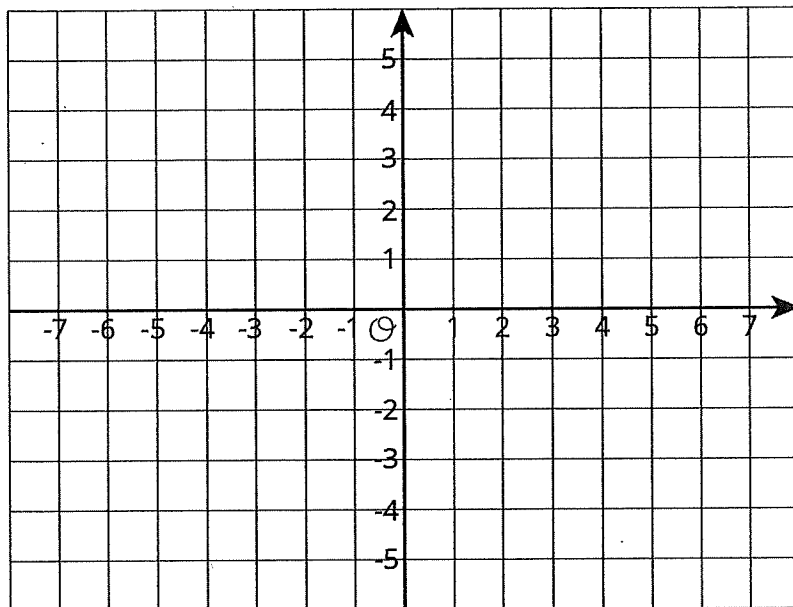
### Possible Solutions

Answers vary. Sample response: The coordinates of each point are  $(1, 5)$ ,  $(1, 0)$ ,  $(2, 5)$ ,  $(2, 0)$ .

## Lesson 15 Practice Problems

### Problem 3

- a. Plot and connect the following points to form a polygon.  
(-3, 2), (2, 2), (2, -4), (-1, -4), (-1, -2), (-3, -2), (-3, 2)



- b. Find the perimeter of the polygon.

### Possible Solutions

- a. The plotted polygon is a hexagon.  
b. 24 units. (Going in the same order as the points listed, the sides of the polygon have lengths 5, 6, 3, 2, 4, and 4 units.)

### Problem 4

From Grade 6, Unit 6, Lesson 4

For each situation, select **all** the equations that represent it. Choose one equation and solve it.

- a. Jada's cat weighs 3.45 kg. Andre's cat weighs 1.2 kg more than Jada's cat. How much does Andre's cat weigh?

$$x = 3.45 + 1.2$$

$$x = 3.45 - 1.2$$

$$x + 1.2 = 3.45$$

$$x - 1.2 = 3.45$$

- b. Apples cost \$1.60 per pound at the farmer's market. They cost 1.5 times as much at the grocery store. How much do the apples cost per pound at the grocery store?

$$y = (1.5) \cdot (1.60)$$

$$y = 1.60 \div 1.5$$

$$(1.5)y = 1.60$$

$$\frac{y}{1.5} = 1.60$$

**Possible Solutions**

a.  $x = 3.45 + 1.2, x - 1.2 = 3.45; x = 4.65$

b.  $y = 1.5 \cdot 1.60, \frac{y}{1.5} = y = 1.60$

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## Lesson 16 Practice Problems

### Problem 1

A teacher is making gift bags. Each bag is to be filled with pencils and stickers. The teacher has 24 pencils and 36 stickers to use. Each bag will have the same number of each item, with no items left over.

For example, she could make 2 bags with 12 pencils and 18 stickers each.

What are the other possibilities? Explain or show your reasoning.

### Possible Solutions

3 bags with 8 pencils and 12 stickers ( $3 \cdot 8 = 24$  and  $3 \cdot 12 = 36$ )

4 bags with 6 pencils and 9 stickers ( $4 \cdot 6 = 24$  and  $4 \cdot 9 = 36$ )

6 bags with 4 pencils and 6 stickers ( $6 \cdot 4 = 24$  and  $6 \cdot 6 = 36$ )

12 bags with 2 pencils and 3 stickers ( $12 \cdot 2 = 24$  and  $12 \cdot 3 = 36$ )

### Problem 2

- List all the factors of 42.
- What is the greatest common factor of 42 and 15?
- What is the greatest common factor of 42 and 50?

### Possible Solutions

- 1, 2, 3, 6, 7, 14, 21, 42
- 3
- 2

### Problem 3

A school chorus has 90 sixth-grade students and 75 seventh-grade students. The music director wants to make groups of performers, with the same combination of sixth- and seventh-grade students in each group. She wants to form as many groups as possible.

- What is the largest number of groups that could be formed? Explain or show your reasoning.

## Lesson 16 Practice Problems

- b. If that many groups are formed, how many students of each grade level would be in each group?

### Possible Solutions

- a. 15 groups. The greatest common factor of 75 and 90 is 15.  
b. 6 sixth-grade students and 5 seventh-grade students ( $6 \cdot 15 = 90$  and  $5 \cdot 15 = 75$ )

### Problem 4

From Grade 6, Unit 7, Lesson 13

Here are some bank transactions from a bank account last week. Which transactions represent negative values?

Monday: \$650 paycheck deposited

Tuesday: \$40 withdrawal from the ATM at the gas pump

Wednesday: \$20 credit for returned merchandise

Thursday: \$125 deducted for cell phone charges

Friday: \$45 check written to pay for book order

Saturday: \$80 withdrawal for weekend spending money

Sunday: \$10 cash-back reward deposited from a credit card company

### Possible Solutions

Tuesday, Thursday, Friday, and Saturday

### Problem 5

From Grade 6, Unit 4, Lesson 11

Find the quotients.

- a.  $\frac{1}{7} \div \frac{1}{8}$   
b.  $\frac{12}{5} \div \frac{6}{5}$   
c.  $\frac{1}{10} \div 10$   
d.  $\frac{9}{10} \div \frac{10}{9}$

**Possible Solutions**

- a.  $\frac{8}{7}$
- b. 2
- c.  $\frac{1}{100}$
- d.  $\frac{81}{100}$

**Problem 6**

From Grade 6, Unit 2, Lesson 9

An elephant can travel at a constant speed of 25 miles per hour, while a giraffe can travel at a constant speed of 16 miles in  $\frac{1}{2}$  hour.

- a. Which animal runs faster? Explain your reasoning.
- b. How far can each animal run in 3 hours?

**Possible Solutions**

- a. The giraffe is faster, because it covers more distance in the same amount of time.
- b. The elephant can run 75 miles ( $25 \cdot 3 = 75$ ), and the giraffe can run 96 miles ( $16 \cdot 3 \cdot 2 = 96$ ).

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## Lesson 17 Practice Problems

### Problem 1

- A green light blinks every 4 seconds and a yellow light blinks every 5 seconds. When will both lights blink at the same time?
- A red light blinks every 12 seconds and a blue light blinks every 9 seconds. When will both lights blink at the same time?
- Explain how to determine when 2 lights blink together.

### Possible Solutions

- 20, 40, 60, 80, 100... seconds, because these are common multiples of 4 and 5.
- 36, 72, 108... seconds, because these are common multiples of 12 and 9.
- Answers vary. Sample response: They blink together every common multiple.

### Problem 2

- List all multiples of 10 up to 100.
- List all multiples of 15 up to 100.
- What is the least common multiple of 10 and 15?

### Possible Solutions

- 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
- 15, 30, 45, 60, 75, 90
- 30

### Problem 3

Cups are sold in packages of 8. Napkins are sold in packages of 12.

- What is the fewest number of packages of cups and the fewest number of packages of napkins that can be purchased so there will be the same number of cups as napkins?
- How many sets of cups and napkins will there be?

**Possible Solutions**

- a. 3 packages of cups ( $3 \cdot 8 = 24$ ) and 2 packages of napkins ( $2 \cdot 12 = 24$ )
- b. 24 sets

**Problem 4**

From Grade 6, Unit 7, Lesson 14

Rectangle ABCD is drawn on a coordinate plane.  $A = (-6, 9)$  and  $B = (5, 9)$ .

What could be the locations of points C and D?

**Possible Solutions**

Answers vary. Sample responses: C could be  $(-6, -9)$  and D could be  $(5, -9)$ , or C could be  $(-6, 18)$ , and D could be  $(5, 18)$ .

**Problem 5**

From Grade 6, Unit 3, Lesson 14

A school wants to raise \$2,500 to support its music program.

- a. If it has met 20% of its goal so far, how much money has it raised?
- b. If it raises 175% of its goal, how much money will the music program receive? Show your reasoning.

**Possible Solutions**

- a. \$500 ( $2,500 \cdot 0.2 = 500$ )
- b. \$4,375 ( $2,500 \cdot 1.75 = 4,375$ )



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## Lesson 18 Practice Problems

### Problem 1

Mai, Clare, and Noah are making signs to advertise the school dance. It takes Mai 6 minutes to complete a sign, it takes Clare 8 minutes to complete a sign, and it takes Noah 5 minutes to complete a sign. They keep working at the same rate for a half hour.

- Will Mai and Clare complete a sign at the same time? Explain your reasoning.
- Will Mai and Noah complete a sign at the same time? Explain your reasoning.
- Will Clare and Noah complete a sign at the same time? Explain your reasoning.
- Will all three students complete a sign at the same time? Explain your reasoning.

### Possible Solutions

- Answers vary. Sample response: Yes, they will both finish at 24 minutes, because 24 is a common multiple of 6 and 8.
- Answers vary. Sample response: Yes, they will both finish at 30 minutes, because 30 is a common multiple of 6 and 5.
- Answers vary. Sample response: No. The first common multiple of 8 and 5 is 40, and 40 minutes is longer than a half hour.
- Answers vary. Sample response: No. If Clare and Noah will not finish together, then all three won't, either.

### Problem 2

From Grade 6, Unit 7, Lesson 16

Diego has 48 chocolate chip cookies, 64 vanilla cookies, and 100 raisin cookies for a bake sale. He wants to make bags that have all three cookie flavors and the same number of each flavor per bag.

- How many bags can he make without having any cookies left over?
- Find the another solution to this problem.

### Possible Solutions

(The two solutions could swap places.)

- 4 bags with 12 chocolate chip cookies, 16 vanilla cookies, and 25 raisin cookies.
- 2 bags with 24 chocolate chip cookies, 32 vanilla cookies, and 50 raisin cookies.

## Lesson 18 Practice Problems

### Problem 3

- Find the product of 12 and 8.
- Find the greatest common factor of 12 and 8.
- Find the least common multiple of 12 and 8.
- Find the product of the greatest common factor and the least common multiple of 12 and 8.
- What do you notice about the answers to question 1 and question 4?
- Choose 2 other numbers and repeat steps 1-5. Do you get the same results?

### Possible Solutions

- $12 \cdot 8 = 96$
- 4 is the greatest common factor.
- 24 is the least common multiple.
- $4 \cdot 24 = 96$ .
- The answers are the same.
- Answers vary. Yes, the results are the same.

### Problem 4

From Grade 6, Unit 7, Lesson 11

- Given the point  $(5.5, -7)$ , name a second point so that the two points form a vertical segment.
- Given the point  $(3, 3.5)$ , name a second point so that the two points form a horizontal segment.

### Possible Solutions

- Answers vary. Any answer that has an  $x$ -coordinate of 5.5 will form a vertical segment.
- Answers vary. Any answer that has a  $y$ -coordinate of 3.5 will form a horizontal segment.

### Problem 5

From Grade 6, Unit 6, Lesson 9

Find the value of each expression mentally.

a.  $\frac{1}{2} \cdot 37 - \frac{1}{2} \cdot 7$

b.  $3.5 \cdot 40 + 3.5 \cdot 60$

c.  $999 \cdot 5$

**Possible Solutions**

- a. 15
- b. 350
- c. 4995