

**Math Final Exam  
PRACTICE BOOKLET**



**KEEP CALM  
AND  
SHOW YOUR  
WORK!**

**Name:** \_\_\_\_\_ **Period:** \_\_\_\_\_

## EXPONENT REVIEW:

### Multiple Choice:

1. What is the value of  $12^0$ ?

- A** 0                      **B** 12  
**C** 1                        **D** neither

2. Which of the following is not equivalent to  $\left(\frac{3}{5}\right)^{-2}$ ?

- A**  $\frac{25}{9}$                       **B**  $\frac{9}{25}$   
**C**  $\left(\frac{5}{3}\right)^2$                     **D**  $2.\bar{7}$

3. Simplify:

$$(12x^2y^3)(4xy^2)$$

- A**  $16x^3y^5$                 **B**  $3x^2y^6$   
**C**  $48x^3y^5$                 **D**  $48x^2y^6$

4. Which of the following is equivalent to  $(4x^{-2})^3$ ?

- A**  $\frac{64}{x^6}$                       **B**  $\frac{1}{12x^6}$   
**C**  $12x$                     **D**  $64x$

5. Simplify:  $\frac{18r^5t^6}{30r^6t^3}$

- A**  $\frac{3t^3}{5r}$                       **B**  $\frac{3t^3}{4r}$   
**C**  $\frac{3}{5}t^{11}r^9$                 **D**  $0.6rt^3$

6. Multiply:

$$(2.8 \times 10^{15})(8.2 \times 10^{16})$$

- A**  $1.1 \times 10^{31}$             **B**  $2.296 \times 10^{31}$   
**C**  $2.296 \times 10^{32}$         **D**  $2.296 \times 10^{240}$

7. How much bigger is  $4.98 \times 10^{-3}$  than  $5.6 \times 10^{-4}$ ?

- A**  $4.42 \times 10^{-4}$             **B**  $4.42 \times 10^{-3}$   
**C**  $6.2 \times 10^{-4}$             **D**  $1.058 \times 10^{-3}$

8. How many times greater is  $3.5 \times 10^{12}$  than  $7 \times 10^{11}$ ?

- A**  $2.45 \times 10^{24}$             **B** 0.5  
**C**  $5 \times 10^{23}$                 **D** 5

**Short Response:**

9. The population of New York State is approximately  $1.95 \times 10^7$  and the population of Pennsylvania is approximately  $1.275 \times 10^7$ . What is the combined population of NY and PA?
10. The population of New York is approximately  $1.95 \times 10^7$  and the population of the United States is approximately  $3.9 \times 10^9$ . How many times bigger is the US population compared to the New York state population?
11. There are  $5.8 \times 10^5$  college students graduating this spring. These students borrowed a total of  $\$3.915 \times 10^{10}$ . Determine the average amount of loan debt for each student.
12. A mission to Jupiter will take  $2.2 \times 10^4$  hours and a space shuttle travels  $1.75 \times 10^4$  miles per hour. How many miles is the mission?

## Exponent Homework

### Multiple Choice:

1. What is the value of  $\frac{x^3y^5}{x^3y^5}$ ?

**A**  $xy$

**B** 1

**C** 0

**D** neither

2. Which of the following is not equivalent to  $(\frac{1}{2}x^3)^2$ ?

**A**  $\frac{1}{2}x^6$

**B**  $\frac{1}{4}x^6$

**C**  $0.25x^6$

**D**  $\frac{x^6}{4}$

3. Simplify:

$$(15x^5y^3)(4x^{-2}y^{-3})$$

**A**  $19x^3y^6$

**B**  $30x^3$

**C**  $60x^3$

**D**  $60x^3y$

4. Which of the following is equivalent to  $(\frac{1}{3})^{-3}$ ?

**A**  $\frac{1}{3}$

**B**  $\frac{1}{9}$

**C**  $\frac{1}{27}$

**D** 27

5. Simplify:  $\frac{12r^3t^4}{16r^6t^3}$

**A**  $\frac{3t^7}{4r^9}$

**B**  $\frac{2t}{3r^3}$

**C**  $\frac{3t}{4r^3}$

**D**  $0.75r^3t$

6. Multiply:

$$(3 \times 10^{10})(4 \times 10^{12})$$

**A**  $7 \times 10^{22}$

**B**  $12 \times 10^{120}$

**C**  $1.2 \times 10^{22}$

**D**  $1.2 \times 10^{23}$

7. How many times greater is  $3.6 \times 10^{-4}$  than  $4 \times 10^{-5}$ ?

**A** 0.9

**B** 9

**C**  $9 \times 10^{-1}$

**D**  $9 \times 10^{-2}$

8. How much bigger is  $5.8 \times 10^6$  than  $9 \times 10^5$ ?

**A**  $4.9 \times 10^6$

**B**  $4.9 \times 10^1$

**C**  $6.4 \times 10^1$

**D**  $3.2 \times 10^6$

## Short Response:

9. The average cow produces  $2.31 \times 10^3$  gallons of milk per year. The population of cows in the United States is approximately  $9.7 \times 10^7$ . How many gallons of milk are produced each year by cows? Express your answer in scientific notation and standard form.
10. Justin Timberlake has  $\$1.15 \times 10^8$  and Katie Perry has  $\$5.5 \times 10^7$ . How much more money does Justin have than Katie?

## EQUATION REVIEW

### Multiple Choice:

1. Solve the equation below for  $x$ .

$$-2(2x - 6) = 8x$$

- A**  $x = 1$                       **B**  $x = -3$   
**C**  $x = 3$                         **D**  $x = -1$

2. How many solutions does the equation below have?

$$-2(3x - 9) = 6(x + 3)$$

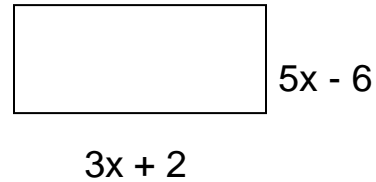
- A** none                              **B** one  
**C** two                                **D** infinite

3. Find the volume of a cylinder with a height of 15 cm. and a radius of 4 cm. in terms of pi.

$$V = \pi r^2 h$$

- A**  $24\pi$                               **B**  $120\pi$   
**C**  $240\pi$                             **D**  $900\pi$

4. Express the perimeter of the rectangle below as an algebraic expression in simplest form.



- A**  $8x - 4$                         **B**  $16x - 8$   
**C**  $15x - 12$                       **D**  $8x + 8$

5. Translate the following sentence into an algebraic equation. Twice the difference of a number and 5 is equivalent to 18.

- A**  $2x - 5 = 18$                       **B**  $2(x - 5) = 18$   
**C**  $\frac{1}{2}x + 5 = 18$                       **D**  $\frac{2x}{5} = 18$

6. Three consecutive even integers have a sum of 54. Which equation can be used to determine the numbers?

- A**  $3x = 54$                         **B**  $3x + 3 = 54$   
**C**  $3x + 6 = 54$                       **D**  $3x + 4 = 54$

**Short Response:**

7. The length of a rectangle is three more than one and a half times the width. The perimeter is 48 inches. Find the length and width.
8. A bowl has a diameter of 24 inches and is filled to the brim with popcorn. Each piece of popcorn has a volume of approximately  $0.9 \text{ in}^3$ . Find the volume of the bowl to the nearest tenth of a cubic inch and determine how many pieces of popcorn can fit in the bowl when it is filled to the top.

$$\text{Sphere Volume: } V = \frac{4}{3}\pi r^3$$

## EQUATION Homework

### Multiple Choice:

1. Solve the equation below for x.

$$12x - 9 = -3(5x + 10)$$

**A**  $x = -7$                       **B**  $x = -9$

**C**  $x = -\frac{7}{9}$                       **D**  $x = -\frac{9}{7}$

2. How many solutions does the equation below have?

$$-4(3x - 1) = 2(-6x + 3)$$

**A** none                      **B** one

**C** two                      **D** infinite

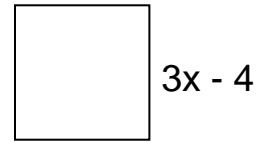
3. Find the volume of the cone with a height of 12 cm. and a radius of 3 cm. in terms of pi.

$$V = \frac{1}{3}\pi r^2 h$$

**A**  $36\pi$                       **B**  $108\pi$

**C**  $324\pi$                       **D**  $144\pi$

4. Express the perimeter of the square below as an algebraic expression in simplest form.



**A**  $6x - 8$                       **B**  $9x - 12$

**C**  $12x - 16$                       **D**  $12x + 16$

5. Translate the following sentence into an algebraic equation. Three times the sum of a number and 9 is equal to 45.

**A**  $3x + 9 = 45$                       **B**  $9(x + 3) = 45$

**C**  $9x + 3 = 45$                       **D**  $3(x + 9) = 45$

6. Four consecutive odd integers have a sum of 112. Which equation can be used to determine the numbers?

**A**  $4x + 9 = 112$                       **B**  $4x = 112$

**C**  $4x - 12 = 112$                       **D**  $4x + 12 = 112$



**Short Response:**

7. The length of a rectangle is five less than three times the width. The perimeter is 46 inches. Find the length and width.

8. A bowl has a diameter of 44 centimeters and is filled to the brim with cheese puffs. Each cheese puff has a volume of approximately  $3 \text{ cm}^3$ . Find the volume of the bowl and determine how many cheese puffs can fit in the bowl when it is filled to the top.

$$\text{Sphere Volume: } V = \frac{4}{3}\pi r^3$$

## FUNCTION REVIEW

### Multiple Choice:

1. Find the value of  $x$  in the function table.

x	8	12	16	20
y	5	7	X	11

- A** 8                                      **B** 9
- C** 7                                      **D** 10
2. Which function rule satisfies the given number pairs?

X	-4	-2	1	3
Y	-9	-7	-4	-2

- A**  $y = 5 - x$                       **B**  $y = x + 5$
- C**  $y = 5x$                           **D**  $y = x - 5$
3. The cost for taking a ferry to the city is \$30 to take your car across and \$8 per person. Which equation represents this scenario?
- A**  $y = 38x$                       **B**  $y = 30 + 8x$
- C**  $y = 30x + 8$                   **D**  $y = 240x$
4. Given the points A(2, -8) and B(4, 0) find the slope of line AB.
- A** -4                                      **B** 4
- C**  $\frac{1}{4}$                                       **D** -8
5. Mason has \$105 in his bank account after saving for 3 weeks, and \$150 after 6 weeks. How much money did he open his account with?
- A** \$45                                      **B** \$40
- C** \$115                                      **D** \$60
6. Which has the steepest slope?
- A** A staircase is 12 feet tall and 6 feet long
- B** A ladder reaches a height of 24 feet when the base is placed 8 feet from a building.
- C** A ramp is 5 feet tall and 15 feet long.
- D** A slide is 16 feet tall and 4 feet long.
7. Which of the following has a  $y$  intercept of -2?
- A**  $y = 5x - 2$                       **B**  $y = -2x$
- C**  $y = x + 2$                           **D**  $y = -\frac{1}{2}x + 3$
8. Which of the following pairs of lines are parallel?
- A**  $y = 3x + 5$  and  $y = 2x + 5$
- B**  $y = -x + 1$  and  $y = x - 1$
- C**  $y = 2x - 3$  and  $y = \frac{1}{2}x - 3$
- D**  $y = 4x$  and  $y = 4x - 2$

**Short Response:**

9. Given the table of values below, answer the questions that follow:

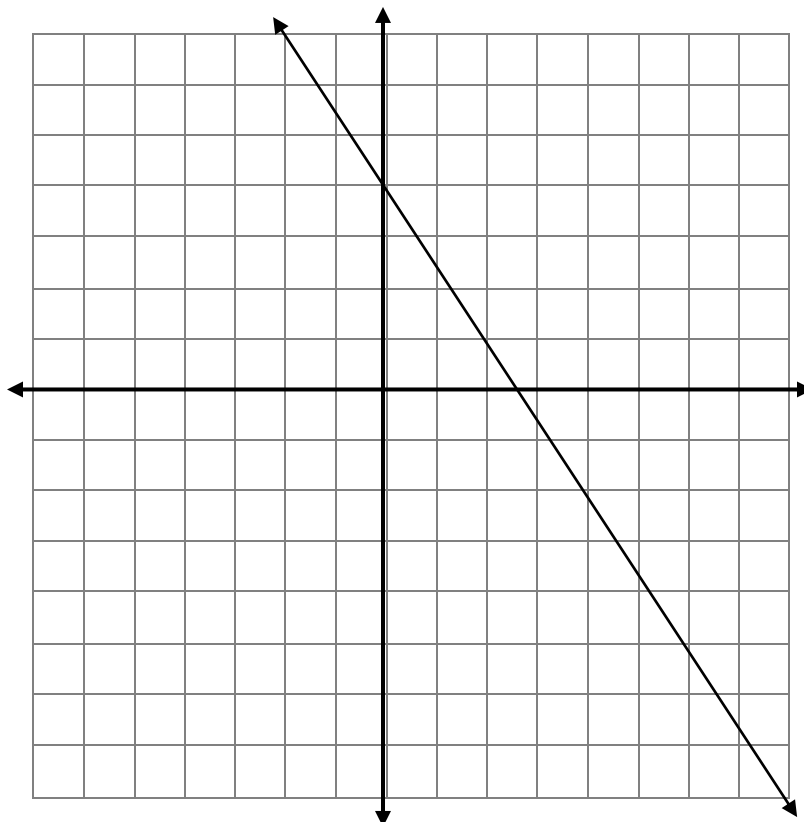
x	y
-3	-1
0	1
3	3
6	5

**Part A** What is the function rule?

**Part B** What is the value of y when x is -12?

**Part C** What is the value of x when y is 19?

10. Find the equation of the line below:



## FUNCTION Homework

### Multiple Choice:

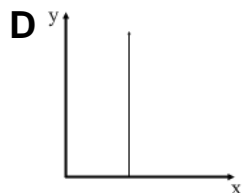
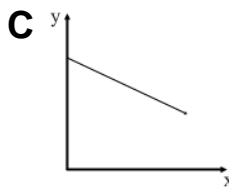
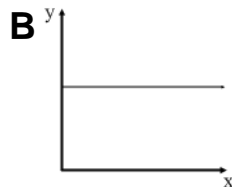
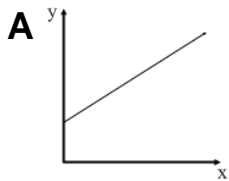
1. The hill of a rollercoaster is 120 feet high and 80 feet wide. What is the slope of the hill?

**A**  $\frac{2}{3}$                       **B**  $\frac{1}{2}$   
**C**  $\frac{3}{2}$                       **D**  $\frac{1}{3}$

2. What is the slope of a line that runs through points, L(9, -2) and M(-5, 5)?

**A**  $\frac{1}{2}$                       **B**  $-\frac{1}{2}$   
**C** 5                      **D**  $-\frac{1}{3}$

3. Which of the following shows a negative slope?



4. Given the function rule  $y = \frac{3}{4}x - 5$ , what is the value of y when x is 12?

**A** -4                      **B** 4  
**C** 9                      **D** -3

5. Which of the function rules below is linear?

**A**  $y = x^2 - 5$                       **B**  $y = \frac{1}{2x}$

**C**  $y = 2\sqrt{x}$                       **D**  $y = \frac{1}{2}x - 5$

6. Find the function rule for the table of values below.

<b>x</b>	-9	-7	-5	-3
<b>y</b>	1	3	5	7

**A**  $y = -\frac{1}{9}x$                       **B**  $y = x - 10$

**C**  $y = x + 10$                       **D**  $y = -x$

7. Given the equation  $y = x^2 - 3$ , determine the value of x when y is 6.

**A** 33                      **B** 3

**C** 9                      **D** 81

8. Which equation below is parallel to  $y = -2x + 8$ ?

**A**  $y = -\frac{1}{2}x + 8$                       **B**  $y = 2x - 8$

**C**  $y = 8x - 2$                       **D**  $y = -2x$

**Short Response:**

9. Given the table below answer the questions that follow:

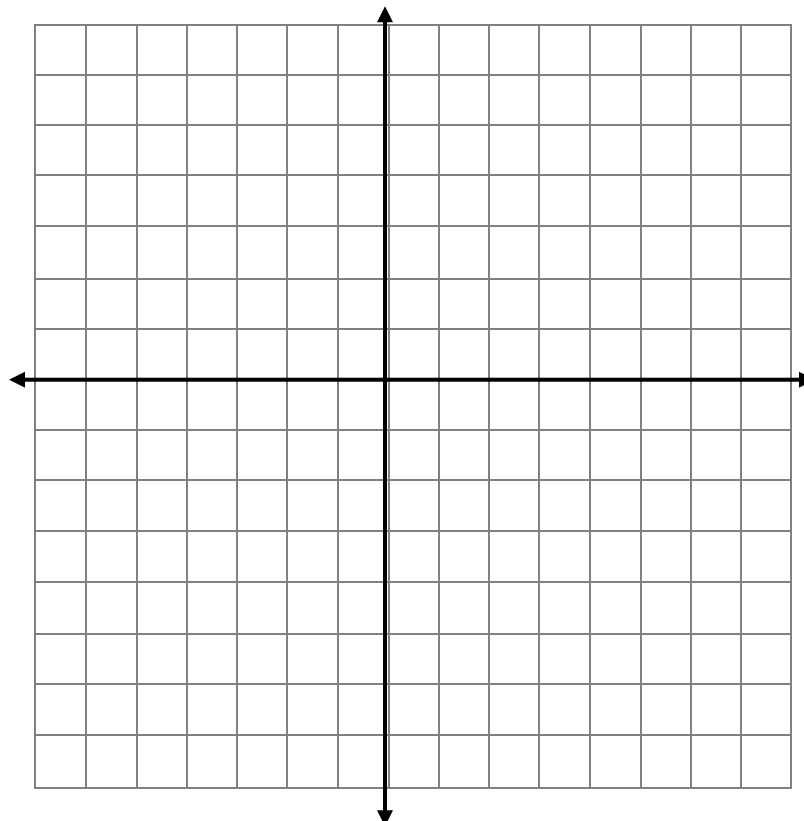
<b>x</b>	<b>y</b>
-4	18
0	12
4	6
8	0

**Part A** What is the function rule?

**Part B** What is the value of  $y$  when  $x$  is  $-20$ ?

**Part C** What is the value of  $x$  when  $y$  is  $48$ ?

10. Graph  $y = -x + 5$  on the coordinate plane below.



## Systems of Equations Review:

### Multiple Choice:

1. Two friends, Jack and Jill, are going to live on different college campuses. Each can calculate their cost per semester by using the function rules below that relates cost to number of credits. Which statement is *true*?

$$\text{Jack: } y = 200x + 5,000$$

$$\text{Jill: } y = 300x + 4,900$$

- A** They spend equal amounts per semester.
- B** Jack spends more money per credit.
- C** Jill spends more money per credit.
- D** Jack attends the more superior school.
2. Using the equations above, how much will one semester cost Jack if he takes 16 credits?

**A** \$3,200

**B** \$4,800

**C** \$8,200

**D** \$5,800

3. What is the solution to the system of equations below?

$$y = 4x - 15$$

$$y = -2x + 9$$

**A** (1, 4)

**B** (4, 1)

**C** (-4, -31)

**D** (12, 33)

4. What is the solution to the system of equations below?

$$3x + 9y = 39$$

$$2x - 9y = -49$$

**A** (10, 1)

**B** (2, -4)

**C** (-2, 0)

**D** (-2, 5)

5. Rewrite the following equation in slope – intercept form.

$$2x - 4y = -32$$

**A**  $y = \frac{1}{2}x + 8$

**B**  $y = \frac{1}{2}x - 8$

**C**  $y = 2x - 16$

**D**  $y = 2x - 28$

6. Rewrite the following equation in slope – intercept form.

$$-9x + 3y = -15$$

**A**  $y = 3x + 5$

**B**  $y = -3x + 5$

**C**  $y = \frac{1}{3}x - 5$

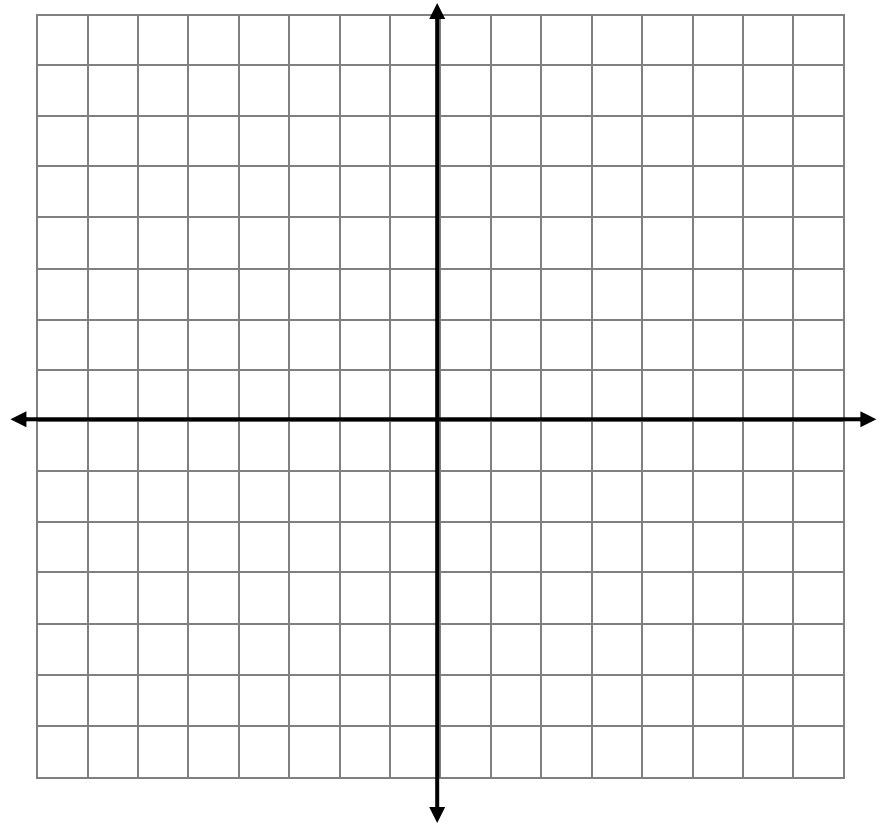
**D**  $y = 3x - 5$

**Short Response:**

7. Find the solution to the following system of equations graphically.

$$y = -2x + 3$$

$$y = \frac{1}{3}x - 4$$



8. Andrew went to the grocery store and bought one protein bar and one bottle of water for \$4.20. The next day he bought 5 of the same protein bars and 2 bottles of water for \$15.30. Write and solve a system of equation to determine how much does each item cost.

## Systems of Equations Homework:

### Multiple Choice:

1. The temperatures of two different cities on a day in December can be found using the function rules below. Which statement is **false**?

Wilmington, N.C.:  $y = 0.5x + 36$

Buffalo, N.Y.:  $y = -2x + 36$

- A** The temperature in Wilmington is increasing throughout the day.
- B** The temperature in Buffalo is increasing throughout the day.
- C** Both cities started the day at the same temperature.
- D** The temperature in Buffalo is changing more rapidly.
2. Mr. Moran won the lottery and decided to quit his job. He won a total of 750,000 after taxes and spends \$5,000 a month. Which function below represents this situation?
- A**  $y = 5,000x + 750,000$
- B**  $y = 750,000x - 5,000$
- C**  $750,000 = -5,000x$
- D**  $y = -5,000x + 750,000$

3. What is the solution to the system of equations below?

$$y = 5x - 18$$

$$y = -3x + 30$$

- A** (8, 22)                      **B** (6, 12)
- C** (-6, -48)                      **D** (6, 18)

4. What is the solution to the system of equations below?

$$5x - 8y = -17$$

$$-5x - 3y = -27$$

- A** (4, -3)                      **B** (3, 4)
- C** (-3, -4)                      **D** (-44, 11)

5. Rewrite the following equation in slope – intercept form.

$$3x - 4y = -24$$

- A**  $y = \frac{3}{4}x + 8$                       **B**  $y = \frac{3}{4}x + 6$
- C**  $y = x - 20$                       **D**  $y = -x - 28$

6. Rewrite the following equation in slope – intercept form.

$$-6x + 2y = -18$$

- A**  $y = 3x + 9$                       **B**  $y = -3x + 9$
- C**  $y = \frac{1}{3}x - 9$                       **D**  $y = 3x - 9$



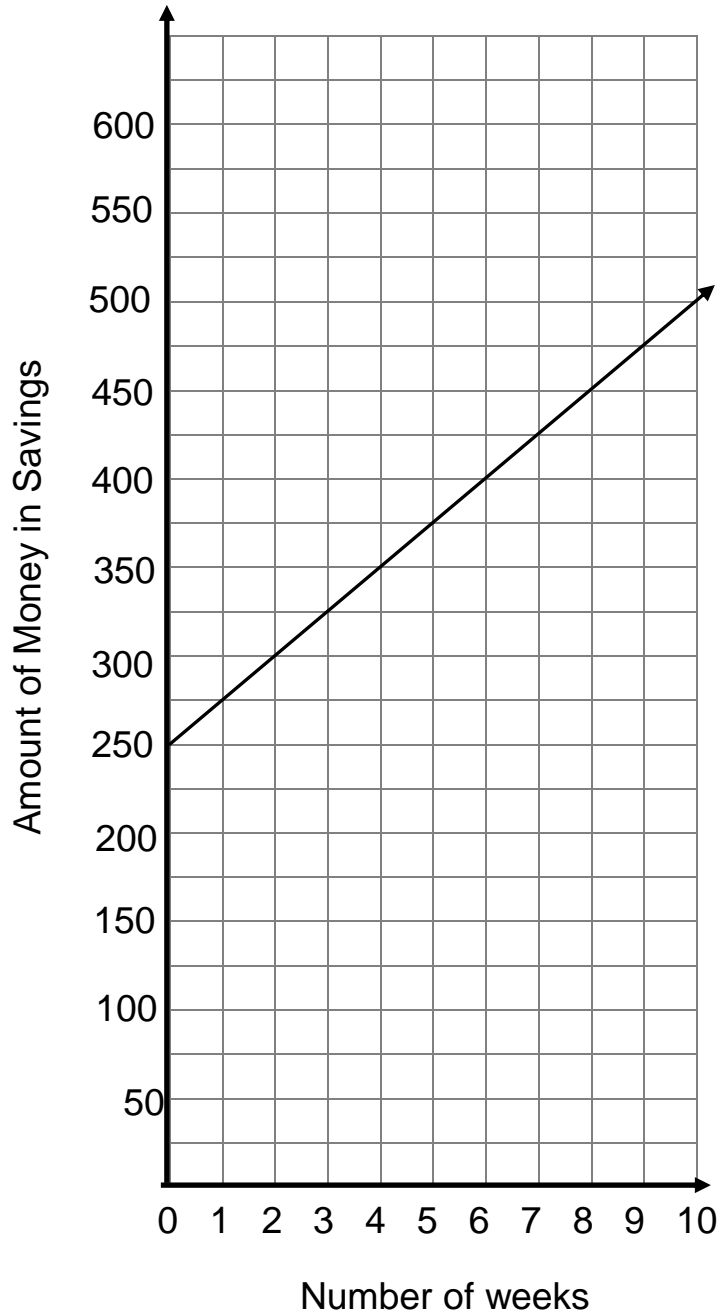
**Short Response:**

7. Julie and Jimmy track their savings account as shown below. Answer the questions that follow.

**Julie's Account**

Number of Weeks Past	Savings
2	\$220
4	\$290
6	\$360
8	\$430

**Jimmy's Account**



**Part A** How much money did Julie open her account with?

**Part B** At what number of weeks will they have the same amount of money in their accounts?

**Part C** Who will have more money after 20 weeks? Explain or show work.

## Angle Review

### Multiple Choice:

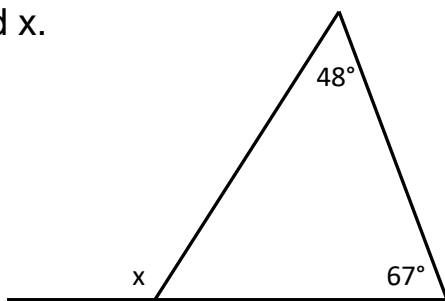
1. A pair of complementary angles are given as  $3x - 8$  and  $5x + 2$ . What is the value of  $x$ ?

- A**  $x = 50$                       **B**  $x = 12$   
**C**  $x = 23.25$                   **D**  $x = 95$

2. A pair of supplementary angles are given as  $4x - 5$  and  $2x - 7$ . What is the value of  $x$ ?

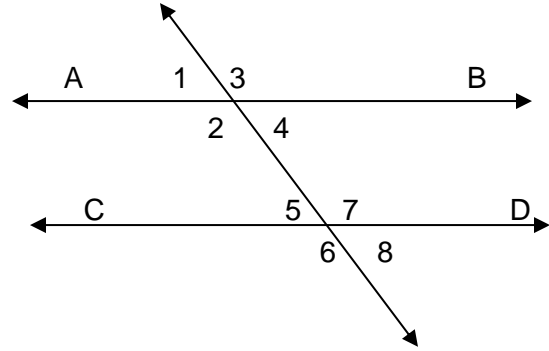
- A**  $x = 21$                       **B**  $x = 91$   
**C**  $x = 32$                       **D**  $x = 24$

3. Find  $x$ .



- A**  $113^\circ$                       **B**  $132^\circ$   
**C**  $180^\circ$                       **D**  $115^\circ$

Use the diagram below to answer questions 4 – 6.



4. Line AB and line CD are parallel. They are cut by the transversal line XY. What describes the relationship of  $\angle 1$  and  $\angle 5$ ?

- A** Vertical Angles  
**B** Supplementary Angles  
**C** Corresponding Angles  
**D** Alternate Interior

5. Which pair of angles are alternate exterior angles?

- A**  $\angle 1$  &  $\angle 8$                   **B**  $\angle 1$  &  $\angle 6$   
**C**  $\angle 1$  &  $\angle 7$                   **D**  $\angle 1$  &  $\angle 4$

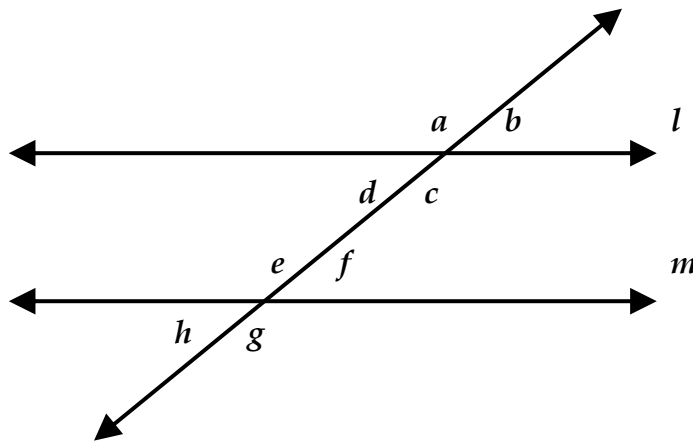
6. Which of the following is **not true** about the angles formed in the diagram above?

- A**  $\angle 2 \cong \angle 4$     **B**  $\angle 3 + \angle 4 = 180^\circ$   
**C**  $\angle 5 \cong \angle 8$     **D**  $\angle 1 + \angle 6 = 180^\circ$

**Short Response:**

7. A pair of angles are complementary. If  $\angle A = \frac{1}{2}x + 3$  and  $\angle B = \frac{3}{2}x - 9$  find the value of  $x$  and each angle measure.

8. In the following figure  $l \parallel m$ .



**Part A** Angle  $d$  measures  $8x - 12$  degrees and angle  $g$  measures  $11x + 2$  degrees. Write an equation to find the measure of angle  $d$  and  $g$ .

$\angle d =$  \_\_\_\_\_  $\angle g =$  \_\_\_\_\_

**Part B** Given the measures above determine the measures of  $\angle e$  and  $\angle h$  and explain how you found your answers.

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## Angle Review Homework:

### Multiple Choice:

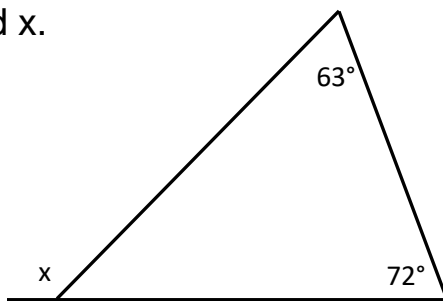
1. A pair of supplementary angles are given as  $5x - 18$  and  $9x - 12$ . What is the value of  $x$ ?

- A**  $x = 14$                       **B**  $x = 15$   
**C**  $x = 46.5$                     **D**  $x = 8.6$

2. A pair of complementary angles are given as  $6x - 30$  and  $10x + 8$ . What is the value of  $x$ ?

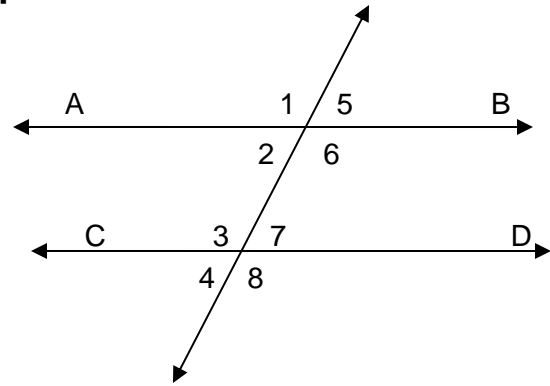
- A**  $x = 16$                       **B**  $x = 5.5$   
**C**  $x = 7$                         **D**  $x = 4$

3. Find  $x$ .



- A**  $135^\circ$                       **B**  $45^\circ$   
**C**  $108^\circ$                     **D**  $117^\circ$

Use the diagram below to answer questions 4 – 6.



4. Line AB and line CD are parallel. They are cut by the transversal line XY. What describes the relationship of  $\angle 2$  and  $\angle 7$ ?

- A** Vertical Angles  
**B** Supplementary Angles  
**C** Corresponding Angles  
**D** Alternate Interior

5. Which pair of angles are corresponding angles?

- A**  $\angle 1$  &  $\angle 8$                       **B**  $\angle 1$  &  $\angle 6$   
**C**  $\angle 1$  &  $\angle 7$                       **D**  $\angle 1$  &  $\angle 3$

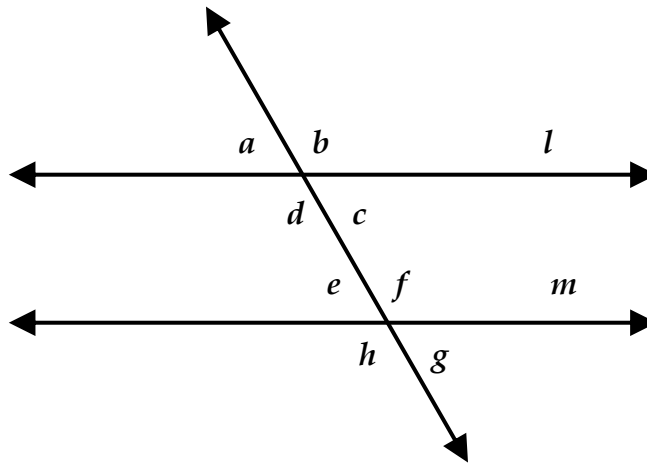
6. Which of the following is not true about the angles formed in the diagram above?

- A**  $\angle 5 \cong \angle 2$                       **B**  $\angle 5 + \angle 6 = 180^\circ$   
**C**  $\angle 4 \cong \angle 8$                       **D**  $\angle 4 + \angle 8 = 180^\circ$

**Short Response:**

7. A pair of angles are supplementary. If  $\angle A = 4x - 8$  and  $\angle B = 2x - 4$  find the value of  $x$  and each angle measure.

8. In the following figure  $l \parallel m$ .



**Part A** Angle  $b$  measures  $4x + 32$  degrees and angle  $h$  measures  $7x - 40$  degrees. Write an equation to find the measure of angle  $b$  and  $h$ .

$\angle b =$  \_\_\_\_\_  $\angle h =$  \_\_\_\_\_

**Part B** Given the measures above determine the measures of  $\angle d$  and  $\angle g$  and explain how you found your answers.

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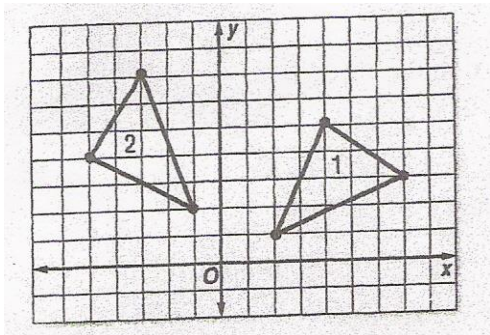
## Transformation Review

### Multiple Choice:

1. If point D(-4, 5) is translated 3 units to the right and 4 units down, which coordinates represent D'?

**A** (-7, 7)                      **B** (-1, -3)  
**C** (-1, 1)                      **D** (1, 9)

2. Melinda drew a picture and then transformed it. What transformation did she make?



**A** rotation                      **B** dilation  
**C** translation                      **D** reflection

3. Figure QRST has vertices Q(2, -1), R(6, -1), S(6, -3), and T(2, -3). Which will be the coordinate of S after the rectangle is rotated 180°?

**A** (-6, -3)                      **B** (-6, 3)  
**C** (-3, 6)                      **D** (3, 6)

4. Line XY is dilated by a scale factor of  $\frac{3}{4}$ . If the original coordinates were X(4, 8) and Y(12, 16), find the new coordinates.

**A** X'(12, 24) Y'(36, 48)  
**B** X'(2, 4) Y'(6, 8)  
**C** X'(1, 2) Y'(3, 4)  
**D** X'(3, 6) Y'(9, 12)

5. Triangle SKY has vertices S(1, 3), K(5, 3) and Y(3, 8). Which will be the coordinate of K after the triangle is reflected over the x – axis?

**A** (5, -3)                      **B** (-5, 3)  
**C** (-3, 5)                      **D** (-5, -3)

6. Which type of transformation below does not result in a shape that is congruent to the original?

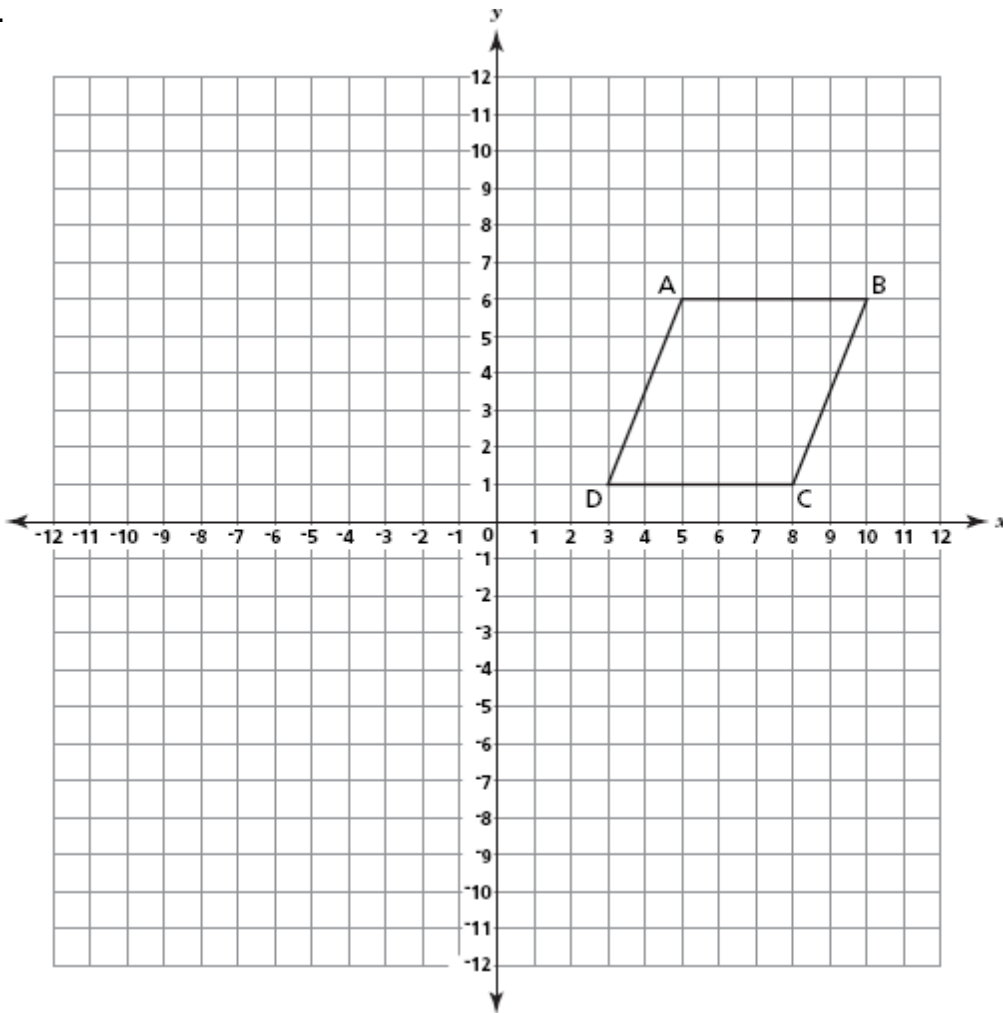
**A** Reflection                      **B** Translation  
**C** Rotation                      **D** Dilation

## Short Response

On the coordinate plane below, draw the image of quadrilateral ABCD when reflected over the  $x$ -axis. Label the image  $A'B'C'D'$ .

Then draw the image of  $A'B'C'D'$  when translated 9 units to the left and 4 units down. Label the new image  $A''B''C''D''$ .

Last draw the image of  $A''B''C''D''$  when rotated  $90^\circ$  clockwise. Label the new image  $A'''B'''C'''D'''$ .

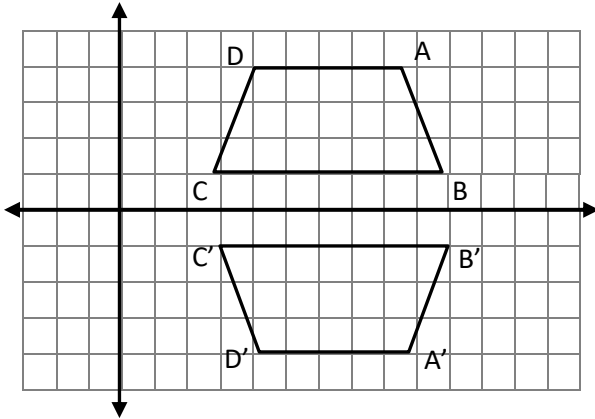


ABCD	After a reflection in the $x$ -axis	After a translation 9 units left and 4 units down	After a $90^\circ$ Clockwise Rotation
A(5,6)	A' (            )	A'' (            )	A''' (            )
B(10, 6)	B' (            )	B'' (            )	B''' (            )
C(8, 1)	C' (            )	C'' (            )	C''' (            )
D(3, 1)	D' (            )	D'' (            )	D''' (            )

## Transformation Homework

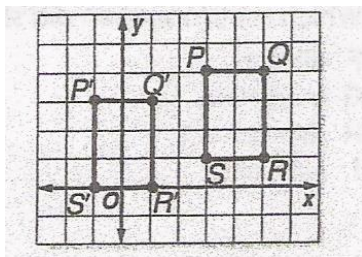
### Multiple Choice:

1. Melinda drew a picture and then transformed it. What transformation did she make?



- A** rotation                      **B** dilation  
**C** translation                  **D** reflection

2. Which notation describes the translation of the figure shown below?



- A**  $(x, y) \rightarrow (x - 4, y - 1)$   
**B**  $(x, y) \rightarrow (x + 3, y - 1)$   
**C**  $(x, y) \rightarrow (x + 3, y + 1)$   
**D**  $(x, y) \rightarrow (x - 2, y + 1)$

3. A shape is drawn in the second quadrant of a coordinate plane. If it is rotated  $90^\circ$  counter clockwise, what quadrant will it end up in?

- A** First                              **B** Second  
**C** Third                              **D** Fourth

4. The coordinate  $A(-12, 9)$  is dilated by a scale factor of  $\frac{2}{3}$ . Where is  $A'$  located?

- A**  $(9, -12)$                       **B**  $(-8, 9)$   
**C**  $(-8, 6)$                       **D**  $(-4, 3)$

5. Which series of transformations will maintain the original shape and size of a figure?

- A** Reflection, translation,  $90^\circ$  rotation.  
**B**  $90^\circ$  Rotation, dilation, translation.  
**C**  $180^\circ$  Rotation, reflection, dilation.  
**D** Dilation, reflection, translation.

6. A shape is drawn in the fourth quadrant, then reflected over the  $x$ -axis and rotated  $180^\circ$ . What quadrant is resulting shape located in?

- A** I                                      **B** II  
**C** III                                   **D** IV



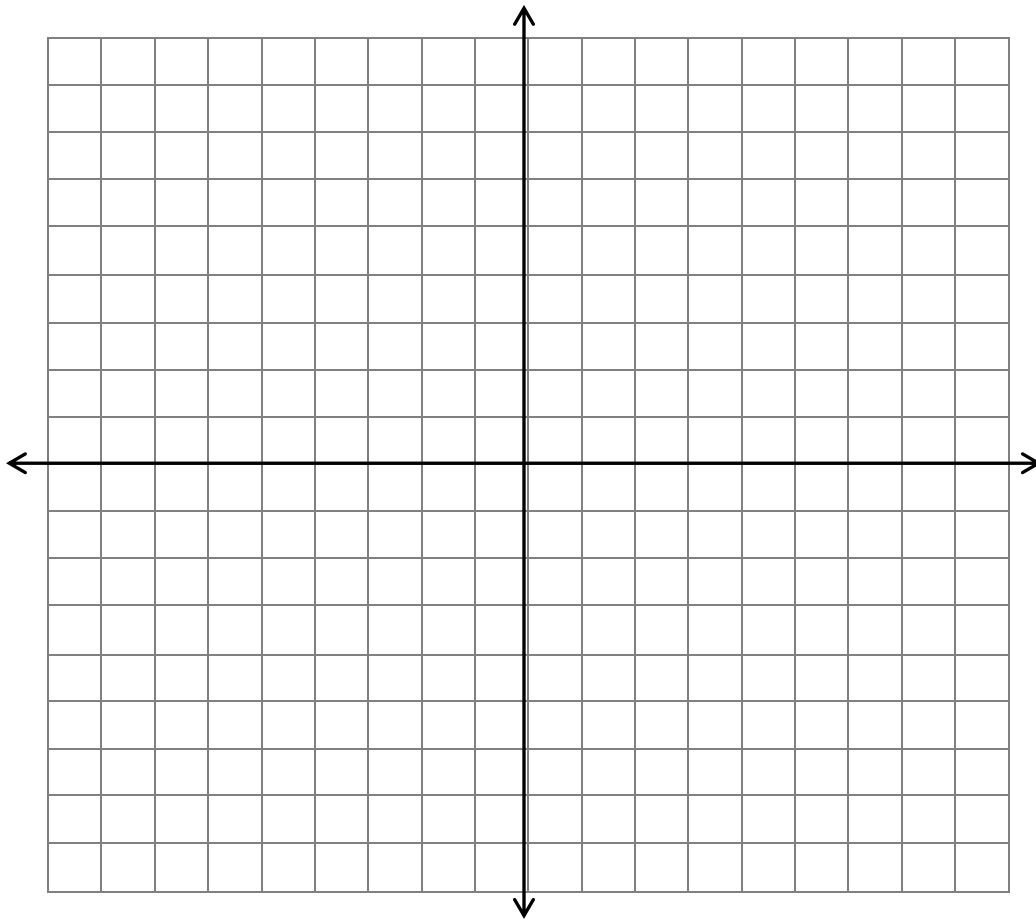
**Short Response:**

On the coordinate plane below, graph the shape  $X(-8, 0)$ ,  $Y(-4, 0)$  and  $Z(-6, 6)$ .

Reflect  $XYZ$  over the  $y$  axis. Label the new coordinates  $X'Y'Z'$ .

Rotate  $X'Y'Z'$   $90^\circ$  clockwise. Label the new coordinates  $X''Y''Z''$ .

Dilate  $X''Y''Z''$  by a scale factor of  $\frac{1}{2}$ . Label the new shape  $X'''Y'''Z'''$ .

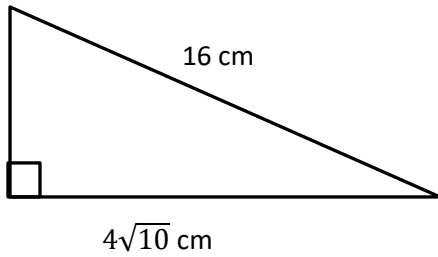


<b>XYZ</b>	<b>After a reflection in the y-axis</b>	<b>After a <math>90^\circ</math> Clockwise Rotation</b>	<b>After a dilation by <math>\frac{1}{2}</math></b>
$X(-8, 0)$	$X'$ (                    )	$X''$ (                    )	$X'''$ (                    )
$Y(-4, 0)$	$Y'$ (                    )	$Y''$ (                    )	$Y'''$ (                    )
$Z(-6, 6)$	$Z'$ (                    )	$Z''$ (                    )	$Z'''$ (                    )



**Short Response:**

9. Given the triangle below, find the length of the missing leg in simplest radical form.



10. The area of a square playground is  $2500 \text{ ft}^2$ . Mark is installing railroad ties around the playground. How many feet of railroad ties does he need?

## Number Sets and Square Roots

### Homework

#### Multiple Choice

1. Which of the following is irrational?

**A**  $\sqrt{289}$

**B**  $4.\bar{8}$

**C**  $\pi$

**D**  $\sqrt[3]{27}$

2. Which of the following is considered not an integer?

**A** 0

**B**  $-\sqrt{16}$

**C**  $-\frac{1}{4}$

**D**  $\frac{32}{8}$

3. Simplify  $\sqrt{90}$ .

**A**  $3\sqrt{10}$

**B**  $9\sqrt{10}$

**C**  $3\sqrt{7}$

**D**  $10\sqrt{9}$

4. Which of the following is equivalent to  $0.\overline{129}$ ?

**A**  $\frac{12}{9}$

**B**  $\frac{43}{333}$

**C**  $\frac{43}{99}$

**D**  $\frac{42}{333}$

5. Which of the following is equivalent to  $5\sqrt{3}$

**A** 15

**B** 75

**C**  $\sqrt{75}$

**D**  $\sqrt{15}$

6. What two consecutive integers is  $\sqrt{158}$  between?

**A** 157 and 159

**B** 11 and 14

**C** 12 and 13

**D** 78 and 80

7. The peak of a barn roof is 14 feet above the walls. If the house spans 16 feet wide, approximately how long is one side of the roof?

$$a^2 + b^2 = c^2$$

**A** 16 feet

**B** 21 feet

**C** 30 feet

**D** 8 feet

8. Evaluate  $\sqrt{\frac{81}{400}}$ .

**A**  $\frac{9}{200}$

**B**  $\frac{9}{40}$

**C**  $\frac{81}{200}$

**D**  $\frac{9}{20}$

**Short Response:**

9. The following lengths represent the sides of a triangle. Is the triangle right? Show your work and explain.

14 in,  $2\sqrt{51}$  in and 20 in.

10. Jane is painting her kitchen ceiling and needs to put painting tape down to avoid painting the walls. Her ceiling is a square with an area of  $196 \text{ ft}^2$ . How many feet of painting tape does she need?