

Name : \_\_\_\_\_

Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

*Crawford***Complete the function table for each equation.**

1)  $y = x + 9$

x	y
-7	2
3	12
5	14
-2	7
-1	8

5)  $y = x - 9$

x	y
9	
4	
-9	
-2	
7	

9)  $y = x - 3$

x	y
6	
-4	
-5	
4	
5	

2)  $y = x - 7$

x	y
4	
-4	
-7	
-9	
-3	

6)  $y = x + 3$

x	y
-3	
-4	
6	
-9	
-5	

10)  $y = x + 8$

x	y
-8	
-5	
1	
7	
6	

3)  $y = x - 8$

x	y
-9	
3	
-2	
6	
-4	

7)  $y = x - 2$

x	y
-4	
1	
-5	
7	
-1	

11)  $y = x - 6$

x	y
-8	
6	
1	
-7	
2	

4)  $y = x + 4$

x	y
4	
6	
-7	
0	
5	

8)  $y = x - 4$

x	y
-6	
-1	
9	
-4	
-2	

12)  $y = x + 6$

x	y
-8	
-6	
-1	
-4	
0	

Name : \_\_\_\_\_

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## In and Out Boxes

Fill in the Empty Boxes.

1)

In	Out
5	
6	
15	
18	

Rule: Subtract 3

2)

In	Out
2	
10	
13	
15	

Rule: Subtract 1

3)

In	Out
2	
6	
10	
15	

Rule: Add 2

4)

In	Out
7	
8	
17	
18	

Rule: Subtract 3

5)

In	2	7	10	14
Out				

Rule: Subtract 2

6)

In	5	8	12	13
Out				

Rule: Add 4

7)

In	0	7	10	12
Out				

Rule: Add 1

8)

In	4	9	12	15
Out				

Rule: Add 5

Write the rule and fill in the empty boxes.

9)

In	Out
3	0
6	3
11	
15	12

Rule: \_\_\_\_\_

10)

In	Out
6	10
7	11
8	
10	14

Rule: \_\_\_\_\_

11)

In	Out
6	
8	3
16	11
19	14

Rule: \_\_\_\_\_

12)

In	Out
9	4
14	
15	10
18	13

Rule: \_\_\_\_\_

13)

In	2	9	10	13
Out	6	13	14	

Rule: \_\_\_\_\_

14)

In	0	4	11	12
Out	1		12	13

Rule: \_\_\_\_\_



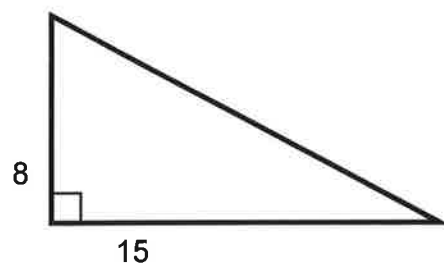
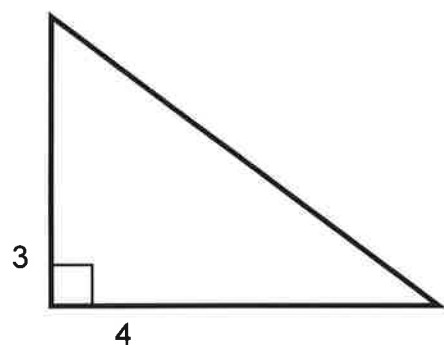
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Teacher : \_\_\_\_\_

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**Find the length of the third side of each triangle.**



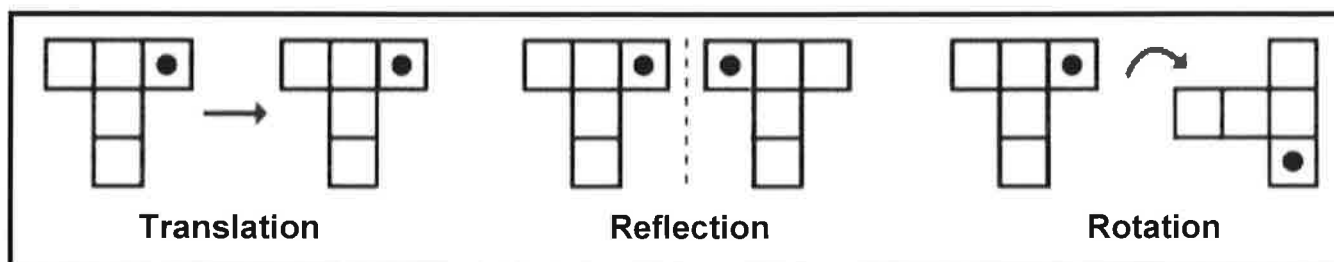
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Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

# Translation, Rotation, and Reflection



Identify each shape as translation, rotation, and reflection.

1)				_____	_____	_____	
3)					_____	_____	_____
5)					_____	_____	_____
7)					_____	_____	_____
2)					_____	_____	_____
4)					_____	_____	_____
6)					_____	_____	_____
8)					_____	_____	_____

Name : \_\_\_\_\_

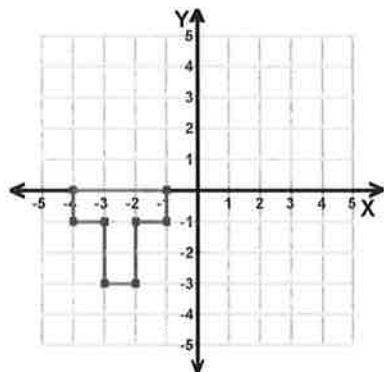
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Teacher : \_\_\_\_\_

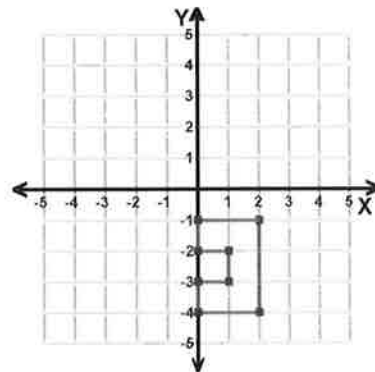
Date : \_\_\_\_\_

## Reflections

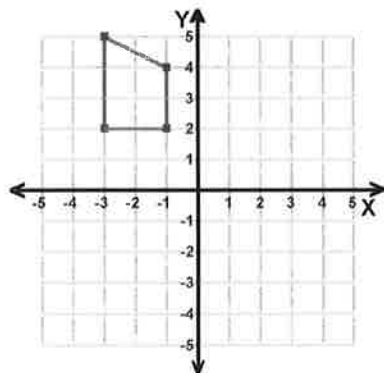
1) Reflection: Across the y-axis



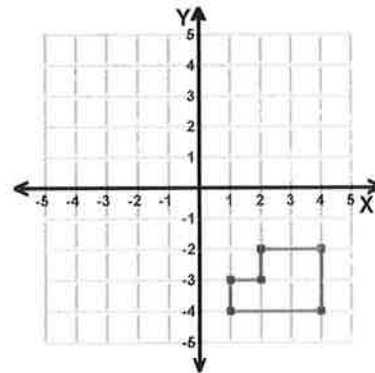
2) Reflection: Across the x-axis



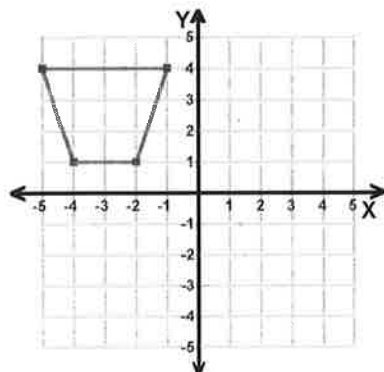
3) Reflection: Across Line  $y = x$



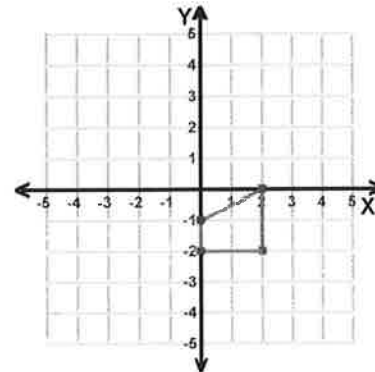
4) Reflection: Across Line  $y = -x$



5) Reflection: Across the line  $x = -1$



6) Reflection: Across the line  $y = -1$



Name : \_\_\_\_\_

Score : \_\_\_\_\_

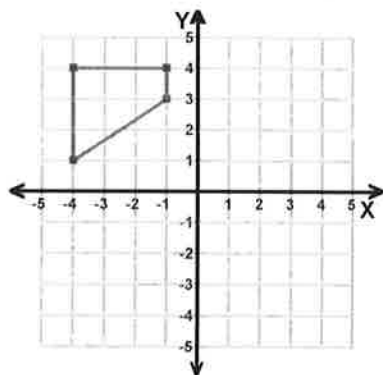
Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

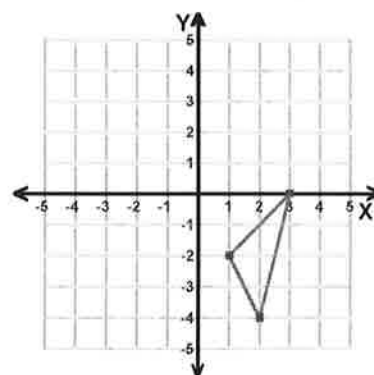
## Transformations

ccw = counterclockwise

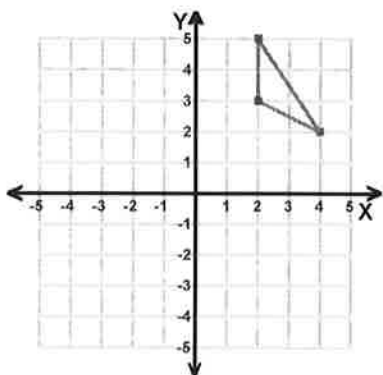
1) Reflection: Across the y-axis



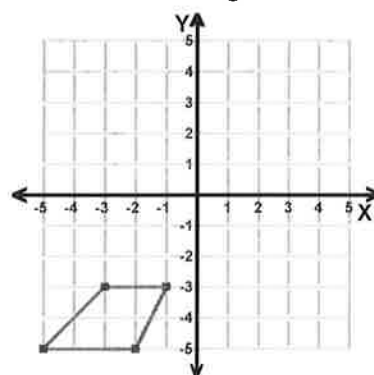
2) Rotation:  $90^\circ$  ccw about the origin



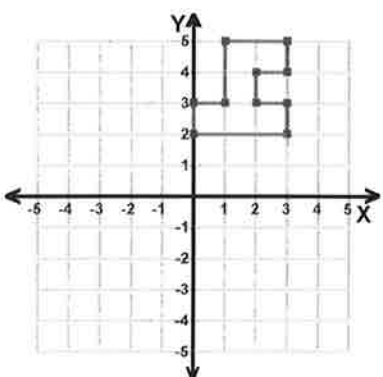
3) Reflection: Across the line  $x = 1$



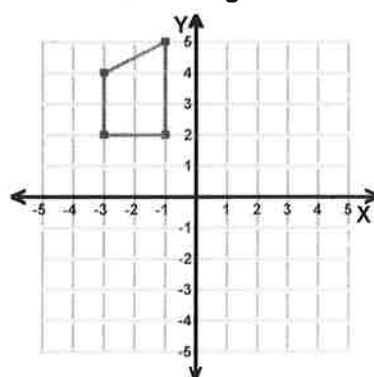
4) Translation: 4 right and 2 up



5) Rotation:  $90^\circ$  clockwise about the origin



6) Translation: 3 right and 3 down



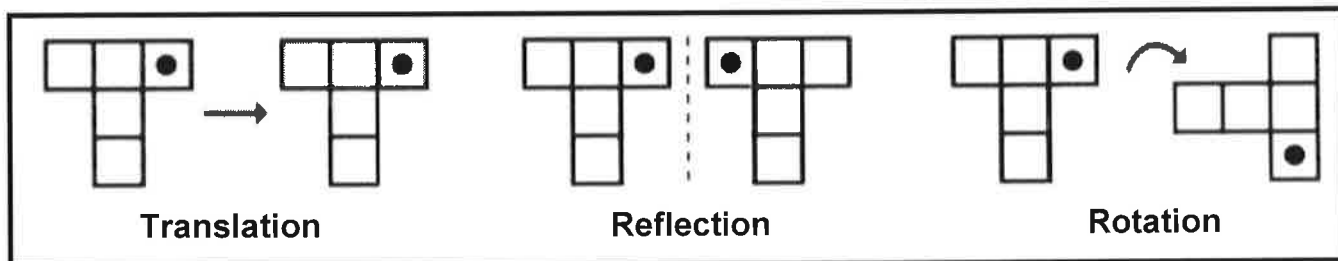
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Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

## Translation, Rotation, and Reflection



Identify each shape as translation, rotation, and reflection.

1)					2)				
	_____	_____	_____			_____	_____	_____	
3)					4)				
	_____	_____	_____			_____	_____	_____	
5)					6)				
	_____	_____	_____			_____	_____	_____	
7)					8)				
	_____	_____	_____			_____	_____	_____	

Name : \_\_\_\_\_

Score : \_\_\_\_\_

Teacher : \_\_\_\_\_

Date : \_\_\_\_\_

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### Solving Systems of Equations by Elimination

1)  $-3x + 2y = 23$

$5x + 2y = -17$

6)  $x + y = 7$

$x - y = 3$

2)  $6x + 7y = -9$

$-4x - 5y = 5$

7)  $-3x + 2y = -3$

$4x - y = -1$

3)  $9x - 2y = -21$

$2x + 3y = 16$

8)  $5x + 2y = 21$

$-x - y = -9$

4)  $x + 7y = 24$

$x - 9y = -24$

9)  $4x - 7y = 5$

$9x - 7y = -15$

5)  $7x - y = -10$

$-7x + 5y = -6$

10)  $3x + y = -14$

$-2x - y = 9$





# Systems of Linear Equations

A system of equations is a collection of two or more equations containing common variables. When solving a system of equations, we try to find values for each of the unknowns that will satisfy every equation in the system.

The equations in the system can be linear or non-linear.

The examples in this handout will be linear equations.

**Example of systems of linear equations:**

$$1) \quad 6x + 7y = -9$$

$$2) \quad -4x - 5y = 5$$

This example has two equations and two unknowns.

In this handout we will show solutions for the follow methods for solving a system of linear equations.

**Substitution**

**Elimination**

**Graphing**



# Systems of Linear Equations

## The Method of Substitution :

The method of substitution requires five steps, consider the following two equations:

$$\text{Equation (1) } -7x - 2y = -10$$

$$\text{Equation (2) } 6x + y = 15$$

**Step 1:** Now solve for y in one of the two equations. We will choose equation (2) because it is the easiest equation to solve for y. We now have:

$$y = 15 - 6x$$

**Step 2:** Substitute this value of y into equation (1).

$$\text{Equation (1) } \quad -7x - 2y = -10 \quad \text{now becomes}$$

$$\text{New Equation (1) } -7x - 2(15 - 6x) = -10$$

**Step 3:** Solve for x in the New Equation (1).

$$-7x - 2(15 - 6x) = -10$$

$$-7x - 30 + 12x = -10$$

$$5x - 30 = -10$$

$$5x = 20$$

$$x = 4$$

# Systems of Linear Equations

## The Method of Substitution :

**Step 4: Substitute the value of  $x = 4$  into the original Equation (1).**

$$\begin{array}{ll} \text{Equation (1)} & -7x - 2y = -10 \quad \text{now becomes} \\ & -7(4) - 2y = -10 \quad \text{and solve for } y. \\ & -28 - 2y = -10 \\ & -2y = 18 \\ & y = -9 \end{array}$$

**Step 5: Check your answers by substituting the  $x$  and  $y$  values in each of the original equations. The left and right side of each equation should be equal.**

$$\begin{array}{ll} \text{Equation (1)} & -7x - 2y = -10 \quad \text{checking } x = 4 \text{ and } y = -9 \\ & -7(4) - 2(-9) = -10 \\ & -28 + 18 = -10 \\ & -10 = -10 \end{array}$$

$$\begin{array}{ll} \text{Equation (2)} & 6x + y = 15 \quad \text{checking } x = 4 \text{ and } y = -9 \\ & 6(4) + (-9) = 15 \\ & 24 - 9 = 15 \\ & 15 = 15 \end{array}$$

# Systems of Linear Equations

## The Method of Elimination :

The method of elimination requires four steps, consider the following two equations:

**Equation (1)**    $x - 2y = 15$

**Equation (2)**    $2x + 3y = 2$

In a two variable problem you will rewrite the equations so when they are added together one of the variables will be eliminated, and solve for the remaining variable.

**Step 1: Change Equation (1) by multiplying by -2 to obtain a new and equivalent Equation (1).**

**Equation (1)**             $x - 2y = 15$        multiply both sides by -2

**New Equation (1)**    $-2x + 4y = -30$

**Step 2: Add New Equation (1) to Equation (2) to obtain Equation (3).**

**New Equation (1)**    $-2x + 4y = -30$

**Equation (2)**             $2x + 3y = 2$

---

**Equation (3)**             $7y = -28$             now we solve for x.

$y = -4$

# Systems of Linear Equations

**The Method of Elimination :**

**Step 3: Substitute the value of  $y = -4$  into the original Equation (1).**

**Equation (1)**       $x - 2y = 15$     now becomes  
 $x - 2(-4) = 15$       and solve for  $x$ .  
 $x + 8 = 15$   
 $x = 7$

**Step 4: Check your answers by substituting the  $x$  and  $y$  values in each of the original equations. The left and right side of each equation should be equal.**

**Equation (1)**       $x - 2y = 15$       checking  $x = 7$  and  $y = -4$   
 $7 - 2(-4) = 15$   
 $7 + 8 = 15$   
 $15 = 15$

**Equation (2)**       $2x + 3y = 2$       checking  $x = 7$  and  $y = -4$   
 $2(7) + 3(-4) = 2$   
 $14 - 12 = 2$   
 $2 = 2$



# Systems of Linear Equations

## The Graphing Method :

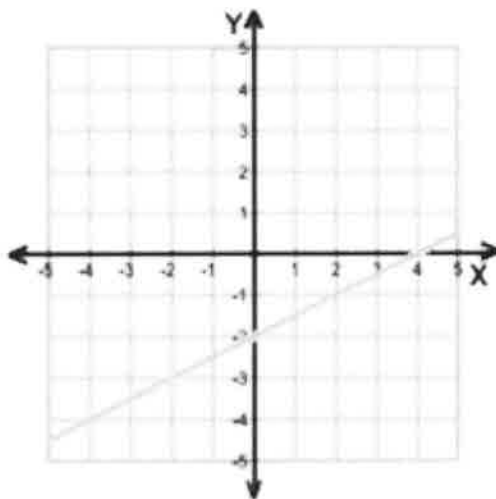
The graphing method requires three steps, consider the following two equations:

**Equation (1)**  $y = \frac{1}{2}x - 2$

**Equation (2)**  $y = -2x + 3$

In a two variable problem you will graph each equation and note the point of intersection.

**Step 1: Graph Equation (1), as shown on the graph below.**

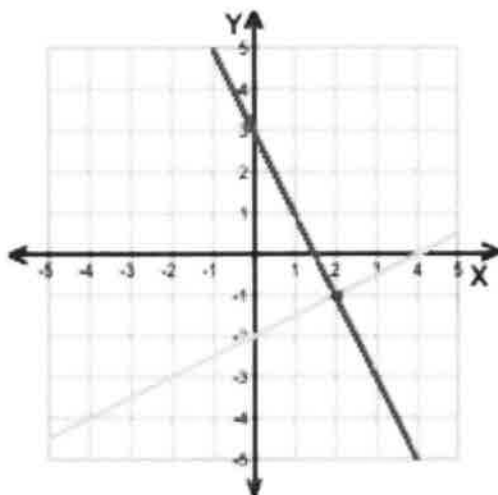


**Equation (1)**  $y = \frac{1}{2}x - 2$

# Systems of Linear Equations

**The Graphing Method :**

**Step 2: Now Graph Equation (2) on the same graph with Equation (1), as shown on the graph below.**



**Equation (1)**    $y = \frac{1}{2}x - 2$

**Equation (2)**    $y = -2x + 3$

**Step 3: The solution is the intersection of the two graphs is (2,-1).**

Name : \_\_\_\_\_ Score : \_\_\_\_\_

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### Solving Systems of Equations by Substitution

1)  $y = 2x - 15$

$$y = 5x$$

6)  $y = \frac{7}{2}x - 5$

$$y = -5$$

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

$$3y = 15$$

7)  $y = \frac{5}{2}x - 4$

$$y = -x + 3$$

3)  $y = \frac{1}{2}x + 5$

$$y = -\frac{5}{2}x - 1$$

8)  $y = \frac{2}{3}x - 1$

$$y = 3$$

4)  $y = -\frac{1}{4}x + 6$

$$y = 4$$

9)  $y = -\frac{13}{4}x + 7$

$$y = -\frac{3}{4}x - 9$$

5)  $y = \frac{1}{3}x + 3$

$$y = 2x - 2$$

10)  $-3x - 5y = 6$

$$y = -3$$





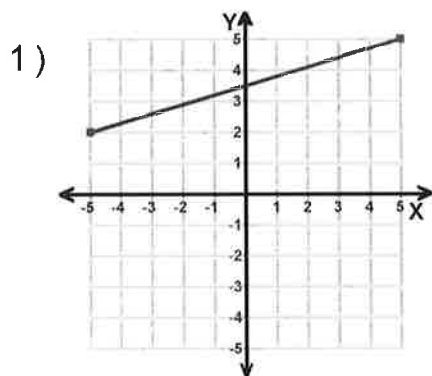
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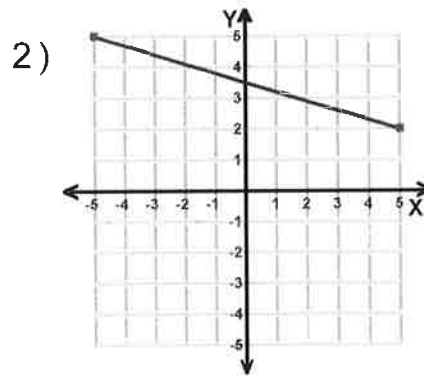
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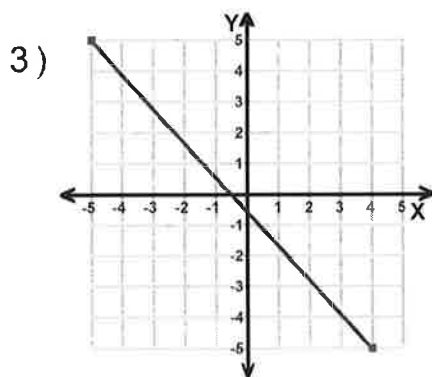
### Find the Slope of Each Line



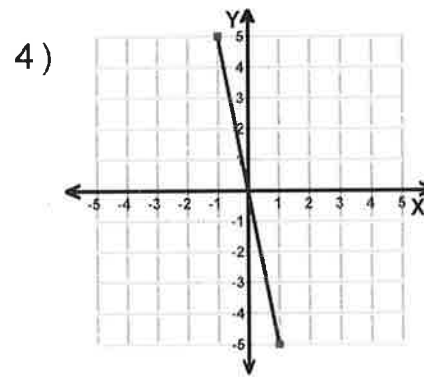
slope = \_\_\_\_\_



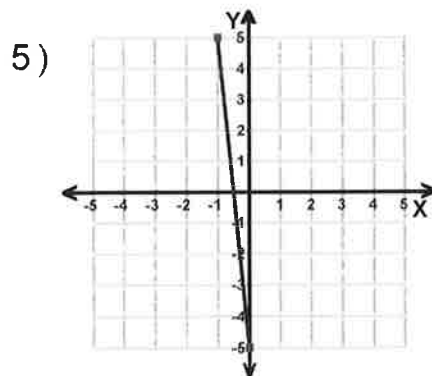
slope = \_\_\_\_\_



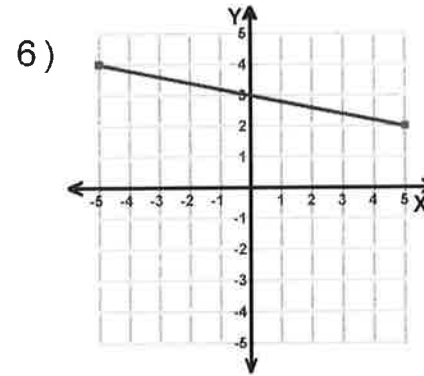
slope = \_\_\_\_\_



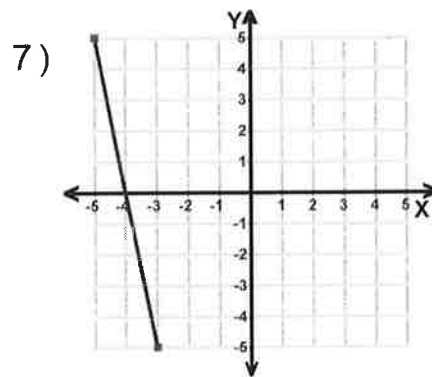
slope = \_\_\_\_\_



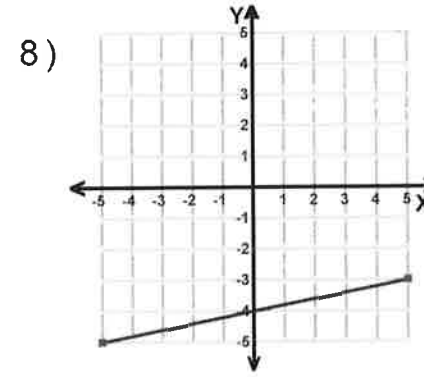
slope = \_\_\_\_\_



slope = \_\_\_\_\_



slope = \_\_\_\_\_



slope = \_\_\_\_\_

Name : \_\_\_\_\_ Score : \_\_\_\_\_

Teacher : \_\_\_\_\_ Date : \_\_\_\_\_

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**Find the Slope and Y-intercept for Each Equation**

1)  $y = -\frac{7}{3}x + 4$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

2)  $y = -\frac{2}{3}x - 2$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

3)  $y = -3x - 3$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

4)  $y = \frac{1}{2}x + 3$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

5)  $y = \frac{1}{3}x + 3$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

6)  $y = 2x - 4$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

7)  $y = -\frac{1}{3}x + 1$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

8)  $y = -2x + 2$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

9)  $y = -x + 3$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_

10)  $y = -\frac{3}{4}x + 4$

slope = \_\_\_\_\_

y-intercept = \_\_\_\_\_



Name : \_\_\_\_\_

Score : \_\_\_\_\_

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**Find the Slope from the Pair of Points**

1)  $(-1, -2)$   $(1, -3)$  slope = \_\_\_\_\_

2)  $(-5, 2)$   $(5, 0)$  slope = \_\_\_\_\_

3)  $(-3, -5)$   $(0, 5)$  slope = \_\_\_\_\_

4)  $(-5, 4)$   $(5, -3)$  slope = \_\_\_\_\_

5)  $(-5, 1)$   $(5, -2)$  slope = \_\_\_\_\_

6)  $(2, 2)$   $(-1, 5)$  slope = \_\_\_\_\_

7)  $(4, -5)$   $(-2, 5)$  slope = \_\_\_\_\_

8)  $(-5, 3)$   $(-1, 5)$  slope = \_\_\_\_\_

9)  $(1, -5)$   $(-5, 5)$  slope = \_\_\_\_\_

10)  $(3, -3)$   $(0, -4)$  slope = \_\_\_\_\_



Name \_\_\_\_\_ Date \_\_\_\_\_

DO NOW

DIRECTIONS: Determine the solution that would satisfy each system of equation using the substitution method.

$$5x - 3y = 14$$

$$2x + y = -23$$

Sophie purchased 8 candles at a total cost of \$32. The red candles cost \$3 each and the silver candles cost \$7 each. The equations and graph below can be used to determine the number of each type of candle Sophie purchased, where  $x$  represents the number of red candles and  $y$  represents the number of silver candles.

Name \_\_\_\_\_ Date \_\_\_\_\_

DO NOW

DIRECTIONS: Determine the solution that would satisfy each system of equation using the substitution method.

$$3x + 2y = 10$$

$$4x + 5y = 11$$

Vincent wants to have balloons delivered to a friend. He can choose between two stores.

- Store J charges \$70.00 for delivery, plus \$2.50 per balloon delivered.
- Store K charges \$60.00 for delivery, plus \$5.00 per balloon delivered.

When will it be better to order from Store J?

Name \_\_\_\_\_ Date \_\_\_\_\_

DO NOW

DIRECTIONS: Determine the solution that would satisfy each system of equation using the substitution method.

$$y = -6x - 5$$

$$y = 2x + 3$$

Opening night tickets for the ballet sold out in less than 3 hours. Orchestra seats cost \$125 each, and balcony seats cost \$55 each. If the performance hall can seat a total of 530 people and the total value of tickets sold was \$51,410, how many orchestra seats and balcony seats are there in the theater?

Name \_\_\_\_\_ Date \_\_\_\_\_

DO NOW

DIRECTIONS: Determine the solution that would satisfy each system of equation using the substitution method.

$$y = 3x + 6$$

$$3y - x = -6$$

Louise printed 40 standard photos and 12 wallet photos from a total of \$6.96. Marcia printed 25 standard photos and 30 wallet photos for a total of \$6.15. Which system of equations can be used to find,  $s$ , the cost in dollars of each standard photo and  $w$ , the cost in dollars of each wallet photo?

Name \_\_\_\_\_ Date \_\_\_\_\_

DO NOW

A school is selling t-shirts and sweatshirts for a fund raiser. The table shows the number of t-shirts and the number of sweatshirts in each of three recent orders. The total cost of orders A and B are given. Each t-shirt has the same cost and each sweatshirt has the same cost. [EE.8c]

Order	Number of T-shirts	Number of Sweatshirts	Total Cost of Order (dollars)
A	2	2	38
B	3	1	35
C	1	2	?

The system of equations shown can be used to represent this situation.

$$\begin{cases} 2x + 2y = 38 \\ 3x + y = 35 \end{cases}$$

Part A: In the system of equations, what does the x represent? What does the y represent? (1 pt)

Part B: If the system of equations is graphed in a coordinate plane, what are the coordinates (x, y) of the intersection of the two lines? (1 pts)

Part C: What is the cost, in dollars, of order C? Explain. (2 pts)