

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## 2-2 The Coordinate Plane, Relations and Functions

### Standards

- B.F.IF.A.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If  $f$  is a function and  $x$  is an element of its domain, then  $f(x)$  denotes the output of  $f$  corresponding to the input  $x$ . The graph of  $f$  is the graph of the equation  $y = f(x)$ .
- B.F.IF.B.3 Recognize functions as mappings of an independent variable into a dependent variable.

### Objective

- SWBAT will determine whether a relation is a function IOT identify the domain and range of a relation.
- SWBAT use the coordinate plane IOT represent mathematical relationships using graphs.

### Key Concepts

\_\_\_\_\_ - pairs of numbers are graphed on this system.

\_\_\_\_\_ - the 4 sections created by both the  $x$ -axis and  $y$ -axis.

\_\_\_\_\_ - the horizontal line that divides the coordinate plane into a top half and a bottom half.

\_\_\_\_\_ - the vertical line that divides the coordinate plane into a left half and a right half.

\_\_\_\_\_ - the point at which the  $x$ -axis and  $y$ -axis cross.

\_\_\_\_\_ - the unique \_\_\_\_\_ and \_\_\_\_\_ that tell the location of a point.

\_\_\_\_\_ - set of ordered pairs.

\_\_\_\_\_ - the set of  $x$ -coordinates in a relation.

\_\_\_\_\_ - the set of  $y$ -coordinates in a relation.

\_\_\_\_\_ - the diagram that shows the relationship between the domain and range in a relation.

\_\_\_\_\_ - a relation in which each element of the domain is paired with exactly one element of the range.

\_\_\_\_\_ - the variable whose values make up the domain.

\_\_\_\_\_ - the variable whose values make up the range.

\_\_\_\_\_ - the test used to determine whether a relation is a function.

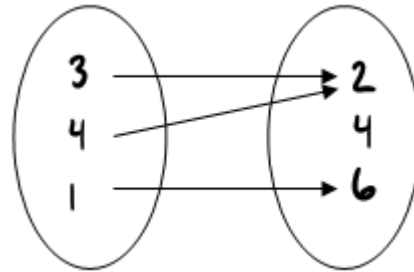
### Examples

1. (I do) Determine whether the relation is a function. State the domain and range.

a.

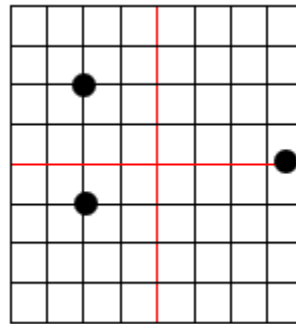
$x$	$y$
-3	4
3	-1
4	-1
4	3

b.



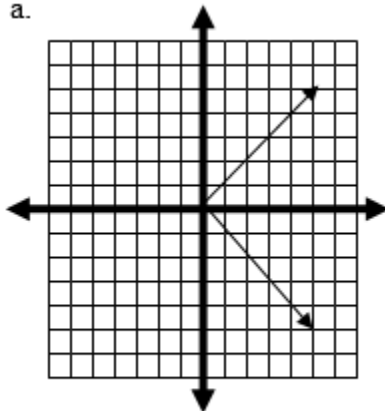
c.  $F = \{(0, 3), (-1, 3), (0, 3), (2, 3)\}$

d.

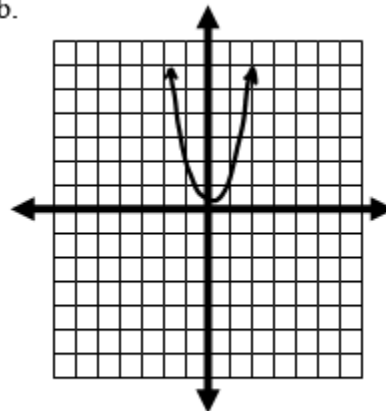


2. (I do) State the domain and range. Determine whether the graph is a function.

a.



b.



3. (We do) Evaluate the function.

a.  $f(x) = 3x + 2; f(6)$

b.  $g(x) = x^2 - 1; g(-1)$

4. (They do) The air conditioner in a car should produce air that is 26 degrees below the temperature outside the car.

a. Write a formula for the inside temperature ( $T$ ) as a function of the outside temperature  $x$ .

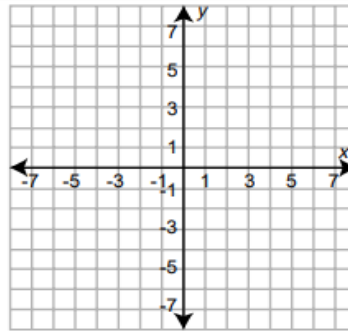
b. What is the temperature inside the car when the outside temperature is  $92^{\circ}\text{F}$ ?

-----Lesson 2-2 Independent Practice/Lesson Check-----

**EXERCISES**

Graph each point on the coordinate plane at the right.

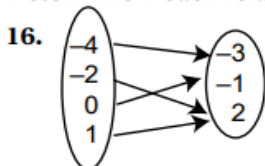
- 1.  $A(2, 4)$       2.  $B(-3, 5)$       3.  $C(6, 0)$
- 4.  $D(0, -3)$     5.  $E(7, -6)$       6.  $F(1, -1)$
- 7.  $G(-2, 3)$     8.  $H(-6, -5)$     9.  $I(-3, -4)$



Give  $f(x) = 3x - 2$ , evaluate each function.

- 10.  $f(-1)$  \_\_\_\_\_      11.  $f(3)$  \_\_\_\_\_      12.  $f(0)$  \_\_\_\_\_
- 13.  $f(-3)$  \_\_\_\_\_      14.  $f\left(\frac{1}{3}\right)$  \_\_\_\_\_      15.  $f(5)$  \_\_\_\_\_

Determine if each relation is a function. Give the domain and range.



17. 

$x$	-1	4	3	3
$y$	3	5	4	-2

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## 2-3 Linear Functions

### Standards

- B.A.CED.A.1 Create equations and inequalities in one variable and use them to solve real world problems.

### Objective

- SWBAT write an equation symbolically IOT express a contextual problem.
- SWBAT will graph linear functions IOT solve linear equations by making a table.

### Key Concepts

\_\_\_\_\_ - a function whose graph is a line

\_\_\_\_\_ - represents a linear function where a solution is any ordered pair  $(x, y)$  that makes the equation true.

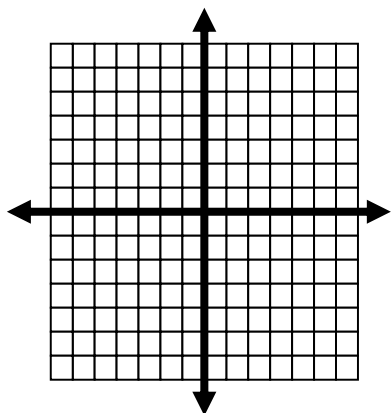
\_\_\_\_\_ - the point in which a line crosses the  $y$ -axis

\_\_\_\_\_ - the point in which a line crosses the  $x$ -axis

\_\_\_\_\_ - values of  $x$  for which  $f(x) = 0$ . Also called  $x$ -intercept.

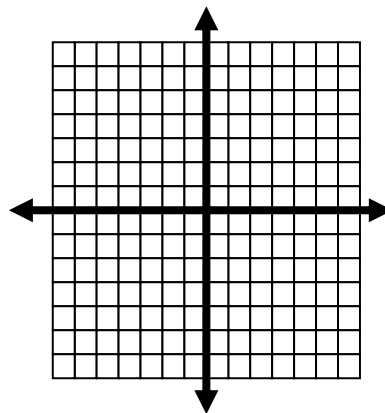
### Examples

1. (I do) Graph  $y = 2x + 3$



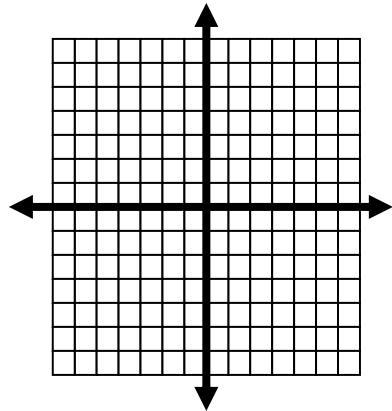
$x$	$y$

2. (I do) Graph  $x = 2$

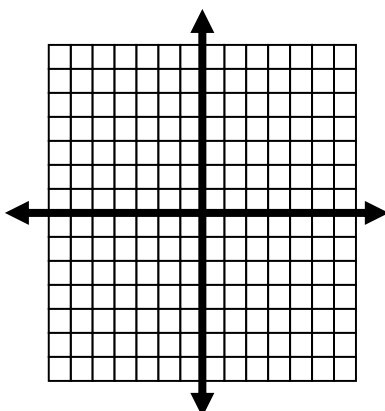


$x$	$y$

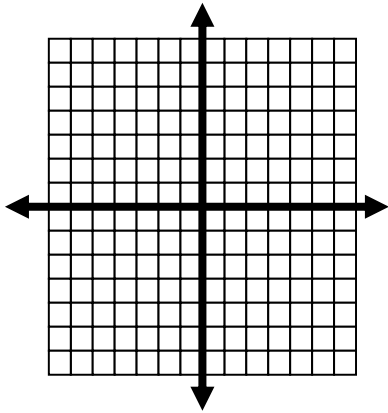
3. (We do) Graph  $y = -1$



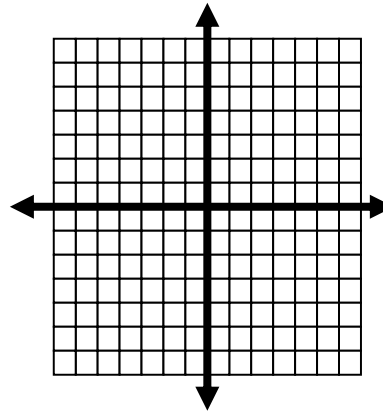
4. (We do) Graph  $y + 3 = -\frac{1}{2}x + 4$



5. (We do) Graph  $y = |x - 3|$



6. (We do) Graph  $y = -|x| + 2$

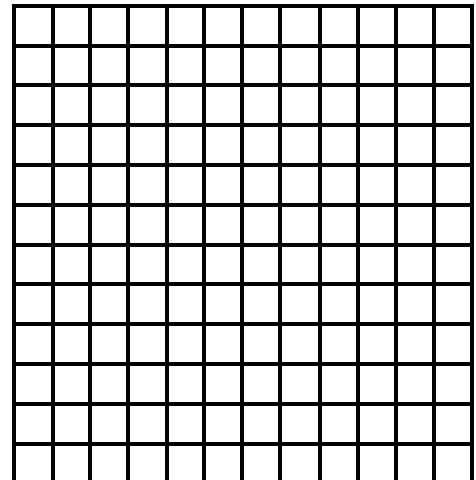


7. (We do) Given  $h(x) = |x + 2|$ , find each value.

a.  $h(0)$

b.  $h(-3)$

8. (They do) The relationship between the scales used to measure temperature in degrees Fahrenheit and degrees Celsius can be represented by the equation  $F = \frac{5}{9}C + 32$ . Graph the function and determine the Fahrenheit temperature that is equivalent to  $35^\circ\text{C}$ .

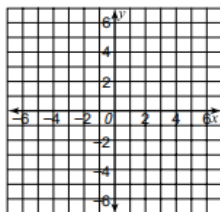


-----Lesson 2-3 Independent Practice/Lesson Check-----

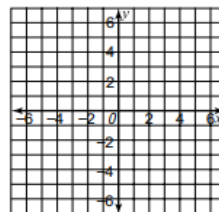
**EXERCISES**

Graph each function.

1.  $y = x$



2.  $y = 2x - 3$



Evaluate  $h(x) = |-x + 6|$  for the graph value of  $x$ .

3.  $h(0)$  \_\_\_\_\_

4.  $h(-2)$  \_\_\_\_\_

5.  $h(5)$  \_\_\_\_\_

6.  $h(-10)$  \_\_\_\_\_

Evaluate  $g(x) = |x - 5|$  for the given value of  $x$ .

7.  $g(-5)$  \_\_\_\_\_

8.  $g(6)$  \_\_\_\_\_

9.  $g(-9)$  \_\_\_\_\_

10.  $g(15)$  \_\_\_\_\_

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## 2-5 Solving Multi-Step Equations Standards

- B.A.CED.A.1 Create equations and inequalities in one variable and use them to solve real world problems.
- B.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities.

### Objective

- SWBAT rewrite literal equations and formulas IOT use them in context.
- SWBAT use properties of equality IOT solve equations.

### Key Concepts

\_\_\_\_\_ - an equation that uses at least 2 letters as variables. You can solve for any variable “in terms of” the other variables.

Property	Definition
Reflexive	$a = a$
Symmetric	If $a = b$ , then $b = a$
Transitive	If $a = b$ and $b = c$ , then $a = c$
Substitution	If $a = b$ , then $b$ may replace $a$ in any expression.
Addition/ Subtraction	If $a = b$ , then $a + c = b + c$ and $a - c = b - c$ .
Multiplication/ Division	If $a = b$ and $c \neq 0$ , then $ac = bc$ and $\frac{a}{c} = \frac{b}{c}$

### Examples

1. (I do) Solve for  $h$ .  $P = 2b + 2h$
2. Solve and Check.  $x + 5 = 2x - 3$
3. Solve and Check.  $6(2x - 1) = -36 + 6$
4. Solve and Check.  $6c + 3 - 2c = 1 + 5c$
5. (We do) Solve and Check.  $15n - 4(4 + 3n) = -5(2n - 5) + 11$

6. (We do) Translate “when 12 is decreased by twice a number, the result is -14” into an equation. Then solve.
7. (They do) Translate “when the sum of twice a number and 3 is multiplied by 5, the result is the same as decreasing the product of 6 and the number by 1” into an equation. Then solve.
8. (They do) Shawn bought 3 CD’S and a DVD. The CD’s were all the same price and the DVD was three less than twice the cost of one CD. The total cost of the 3 CD’s and the DVD was \$42.
- Find the cost of each CD.
  - Find the cost of the DVD.

-----Lesson 2-5 Independent Practice/Lesson Check-----

**EXERCISES**

Solve each equation and check the solution.

- |                                      |                              |
|--------------------------------------|------------------------------|
| 1. $2c + 3 = 15$ _____               | 2. $-3s + 4 = -2$ _____      |
| 3. $-14 = 4d + 6$ _____              | 4. $19 = 25 - 3w$ _____      |
| 5. $2(b + 3) = 2$ _____              | 6. $5y + 3 = 2y + 12$ _____  |
| 7. $5 - 2x = x - 19$ _____           | 8. $7t - 5 + 3t = 15$ _____  |
| 9. $2 - 3(m + 4) = 2$ _____          | 10. $1 - 6r = -4 - 3r$ _____ |
| 11. $\frac{1}{3}(6p - 12) = 5$ _____ | 12. $4(0.5 - w) = -18$ _____ |

Translate each sentence into an equation. Then solve.

13. Six more than twice a number is 16. Find the number. \_\_\_\_\_
14. Four times a number decreased by 12 is 8. Find the number. \_\_\_\_\_
15. When 15 is decreased by three times a number, the result is 21. Find the number.

\_\_\_\_\_

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## 2-6 Solving Inequalities

- B.A.CED.A.1 Create equations and inequalities in one variable and use them to solve real world problems.
- B.A.REI.D.5 Solve a linear inequality using multiple methods and interpret the solution as it applies to the context.

### Objective

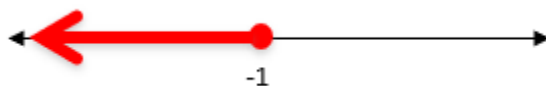
- SWBAT will solve and graph an inequality in one variable IOT interpret the solution of a linear inequality.

### Key Concepts

$x > 4$	$x$ is greater than 4	
$x \geq 4$	$x$ is greater than or equal to 4	
$x < 4$	$x$ is less than 4	
$x \leq 4$	$x$ is less than or equal to 4	

### Examples

1. (I do) What inequality represents the graph?



2. Solve and graph the solution.  $2x \geq 20$
3. Solve and graph the solution.  $-60s > 8$



We do

4. Solve and graph the solution.  $-\frac{3}{7}r \leq 21$       5. Solve and graph the solution.  $-3 < \frac{x}{6}$

6. Solve and graph the solution.  $-2k + 9 \geq 1$

7. Solve and graph.  $4(3d + 1) - 5d \leq 8 - 2(5d + 2)$

8. Of the students surveyed at Cordova High School, fewer than eighty-four said they have never purchased an item online. This is about one eighth of those surveyed. How many students were surveyed?

9. A reporter estimates that  $\frac{2}{3}$  of the hours ( $h$ ) spent on a story increased by 15 hours is less than 27 hours. What values are possible for  $h$ ?

-----Lesson 2-6 Independent Practice/Lesson Check-----

**EXERCISES**

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Solve each inequality and graph the solution on a number line.  
Use your own paper.

1.  $2d + 1 \geq 13$  \_\_\_\_\_      2.  $8 - 3r < -4$  \_\_\_\_\_

3.  $14 \leq 5a + 4$  \_\_\_\_\_      4.  $-5k - 3 > 12$  \_\_\_\_\_

5.  $-10 - 6z \leq 20$  \_\_\_\_\_      6.  $6r - 4 < -10$  \_\_\_\_\_

7.  $\frac{1}{2}q + 4 > 1$  \_\_\_\_\_      8.  $5 - 2k \leq -19$  \_\_\_\_\_

9.  $5n - 6 \leq 12 - n$  \_\_\_\_\_      10.  $8 - z > 2z - 10$  \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## 2-7 Solving Linear Inequalities

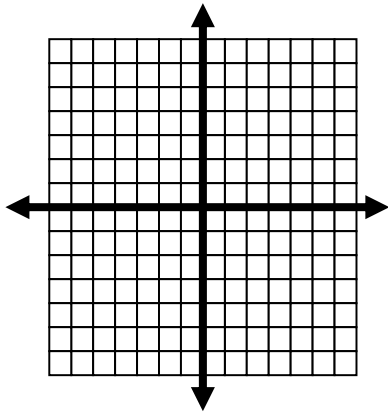
- B.A.CED.A.1 Create equations and inequalities in one variable and use them to solve real world problems.
- B.A.REI.D.5 Solve a linear inequality using multiple methods and interpret the solution as it applies to the context.

### Objective

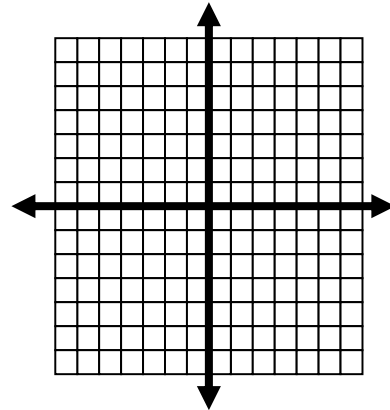
- Students will solve and graph an inequality in two variables IOT interpret the solution of a linear inequality.

### Examples

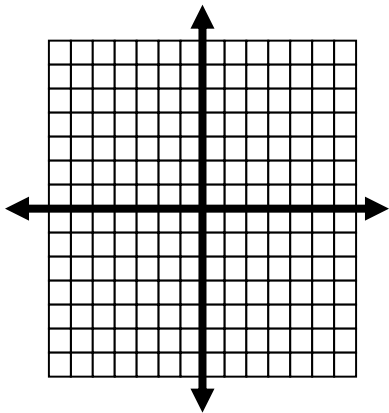
1. (I do) Graph  $y \leq 4x$



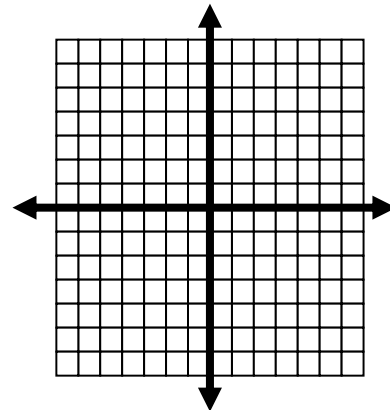
2. (I do) Graph  $y > \frac{3}{2}x - 4$



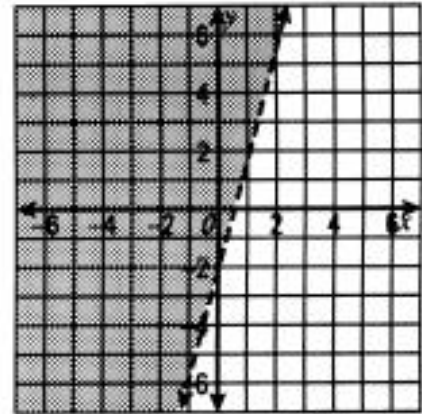
3. (We do) Graph  $4x + 5 > 25$



4. (I do) Graph  $4x + 3y \geq -6$



5. (We do) Write the inequality represented by the graph.

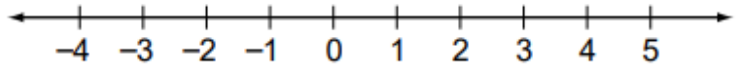


-----Lesson 2-7 Independent Practice/Lesson Check-----

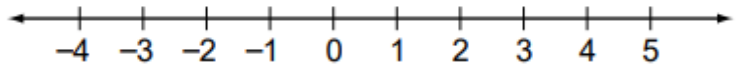
**EXERCISES**

Solve each inequality and graph its solution on the number line.

1.  $3x - 2 \leq 7$  \_\_\_\_\_

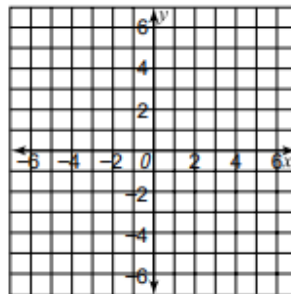


2.  $9 < 5x - 1$  \_\_\_\_\_



Graph each inequality on the coordinate plane.

3.  $2x - 2y \geq -2$



4.  $y < 2x - 3$

