

## Algebra 1

## Unit 1 - Part 2

### Linear Functions

Monday	Tuesday	Wednesday	Thursday	Friday
Jan. 18 <sup>th</sup>	Jan. 19 <sup>th</sup>	Jan. 20 <sup>th</sup>	Jan. 21 <sup>st</sup>	Jan. 22 <sup>nd</sup>
No School	Unit 1 Part 1 Test	Unit 1 Part 1 Test	Graphing Linear Functions	Characteristics of Linear Functions
Jan. 25 <sup>th</sup>	Jan. 26 <sup>th</sup>	Jan. 27 <sup>th</sup>	Jan. 28 <sup>th</sup>	Jan. 29 <sup>th</sup>
Function Notation	PSAT Day - No Class	Arithmetic Sequences	Review Quiz due at midnight	Solving Systems by Graphing
Feb. 1 <sup>st</sup>	Feb. 2 <sup>nd</sup>	Feb. 3 <sup>rd</sup>	Feb. 4 <sup>th</sup>	Feb. 5 <sup>th</sup>
Solving Systems by Substitution	Solving Systems by Elimination Quiz	Quiz due at midnight	Systems of Equations Word Problems	Graphing Systems of Inequalities
Feb. 8 <sup>th</sup>	Feb. 9 <sup>th</sup>	Feb. 10 <sup>th</sup>	Feb. 11 <sup>th</sup>	Feb. 12 <sup>th</sup>
Graphing Systems of Inequalities	Review Test	Test due at midnight	Factoring by GCF	Factoring



## Graphing Linear Functions

In order to graph a linear function, you must know two things: the \_\_\_\_\_ and the \_\_\_\_\_.

### Y-Intercept

The y-intercept is the point on the graph where the \_\_\_\_\_ crosses the \_\_\_\_\_. The y-intercept is represented by the variable \_\_\_\_\_ and can be found at the point \_\_\_\_\_.

### Slope

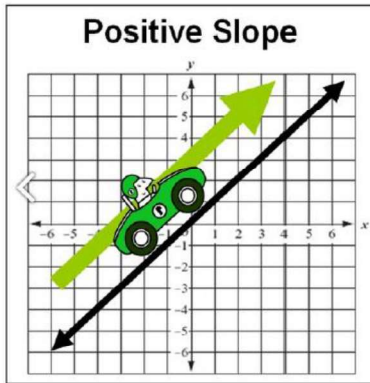
The slope is the constant rate of change of the rise to the run.

The slope is represented by the variable \_\_\_\_\_. If the slope is given to you as a whole number, you can make it a fraction by putting the number over \_\_\_\_\_.

### 4 Types of Slope

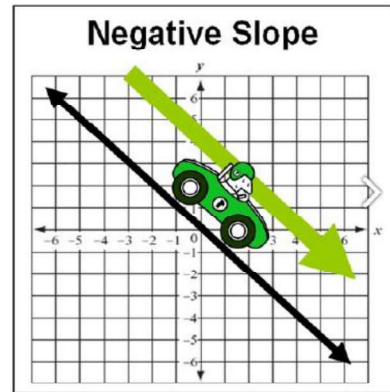
#### Positive Slope

Examples:  
 $\frac{3}{2}$  or 4  
Going up a hill



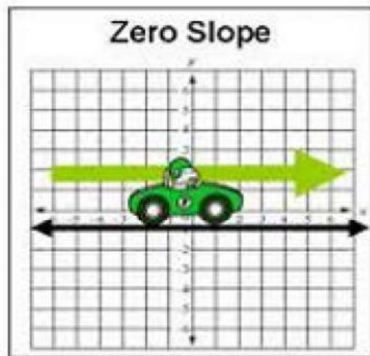
#### Negative Slope

Examples:  
 $-\frac{1}{2}$  or -4  
Going down a hill



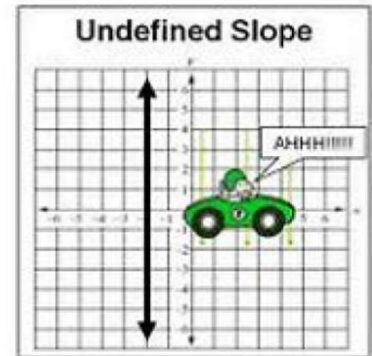
#### Zero Slope

Y-values are the same  
Going in a straight line (No Vertical Change)



#### Undefined Slope

X-values are the same  
Falling off a cliff (No Horizontal Change)



### Slope of a Line

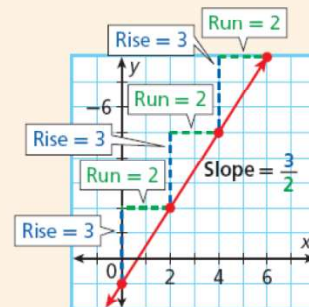
The **rise** is the difference in the **y-values** of two points on a line.

The **run** is the difference in the **x-values** of two points on a line.

The **slope** of a line is the ratio of rise to run for any two points on the line.

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{change in } y}{\text{change in } x}$$

(Remember that **y** is the **dependent variable** and **x** is the **independent variable**.)



## Slope-Intercept Form: $y = mx + b$

**Step 1:** Identify the y-intercept ( $b$ ) and plot the point  $(0, b)$ .

**Step 2:** Use the slope ( $m$ ) to find a second point:  $m = \frac{\text{rise}}{\text{run}}$ . (Remember to make whole numbers into fractions). You can do this several times.

**Step 3:** Connect the points.

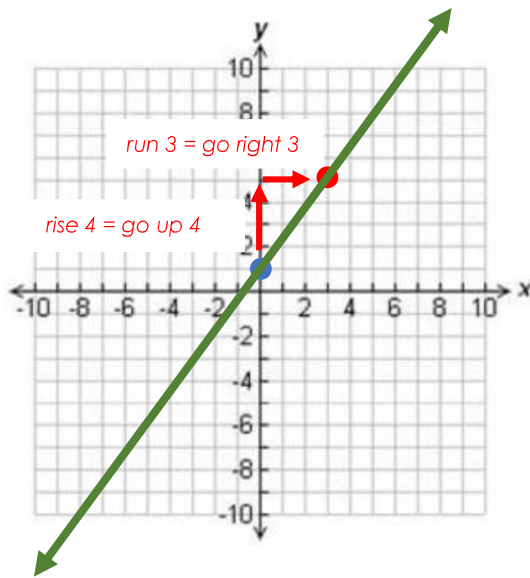
**Example:**  $y = \frac{4}{3}x + 1$

$b = 1$

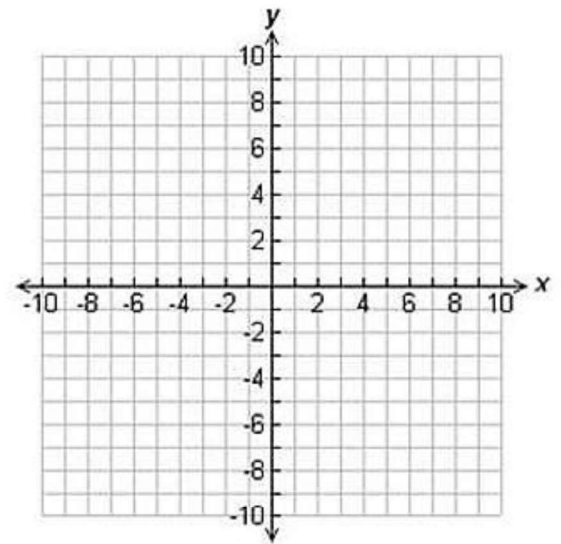
$y\text{-int: } (0, 1)$

$m = \frac{4}{3}$

$\text{slope} = \frac{\text{rise } 4}{\text{run } 3}$

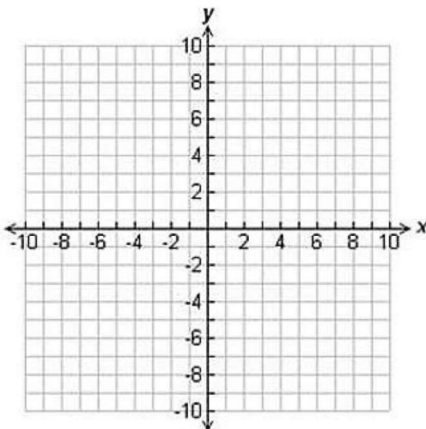


**You Try:**  $y = 3x - 5$

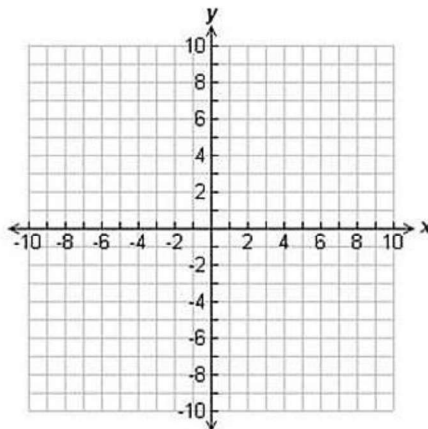


### More Practice

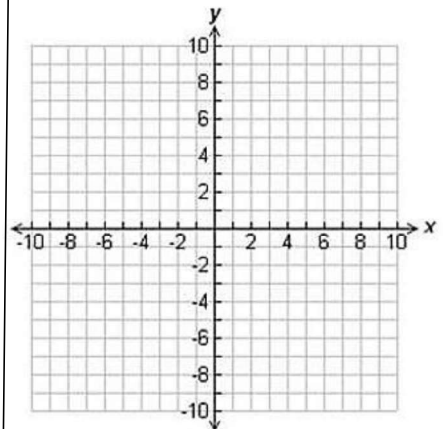
$y = -\frac{2}{3}x + 4$



$y = 4x - 2$

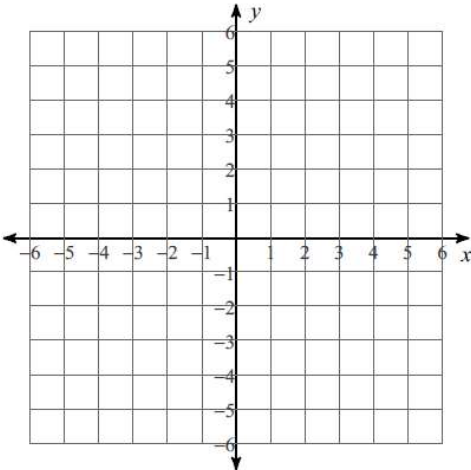


$y = -\frac{1}{4}x - 6$

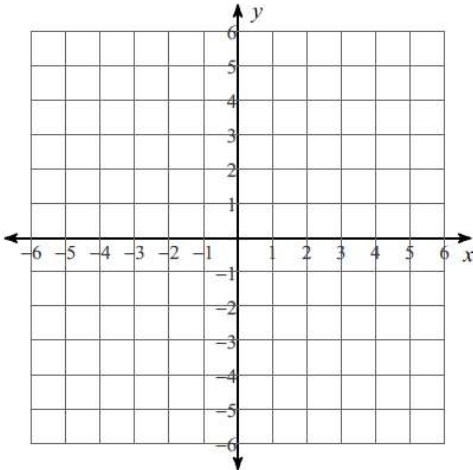


Graphing in Slope-Intercept Form Practice

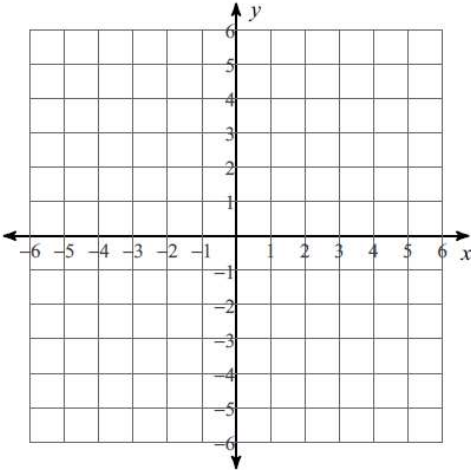
1)  $y = -6x + 5$



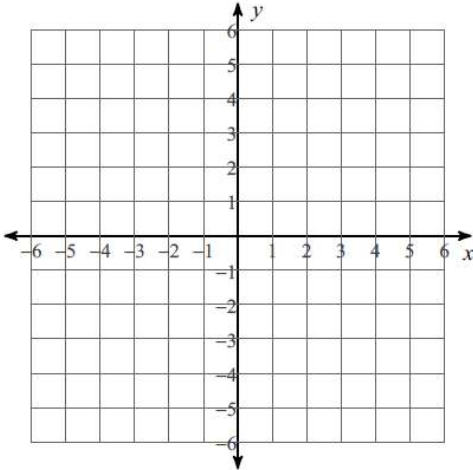
2)  $y = \frac{6}{5}x + 4$



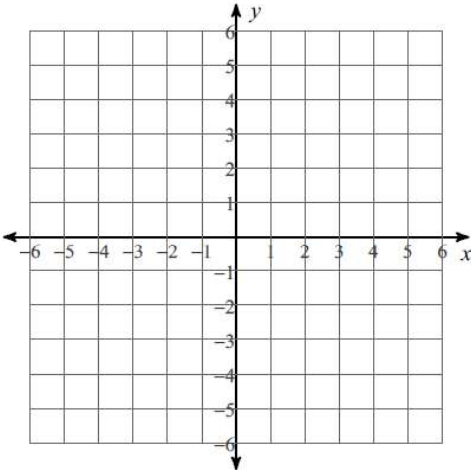
3)  $y = x - 2$



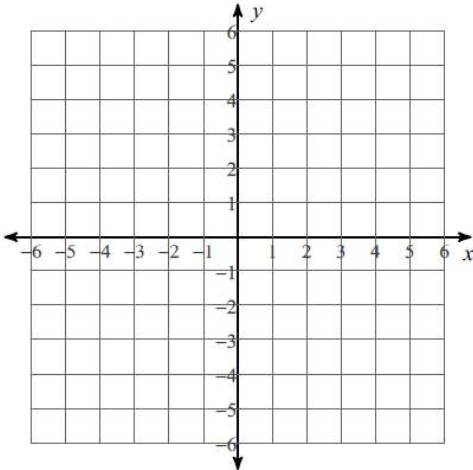
4)  $y = -\frac{3}{2}x - 4$



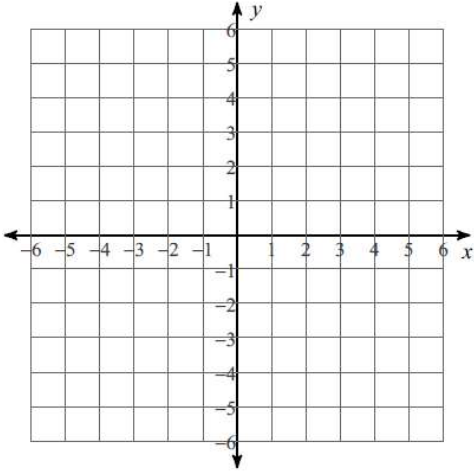
5)  $y = \frac{3}{5}x$



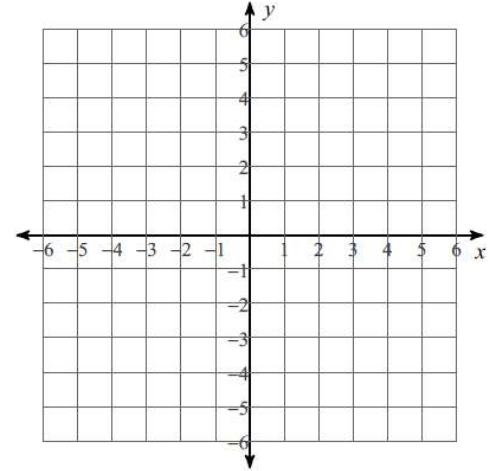
6)  $y = -x - 2$



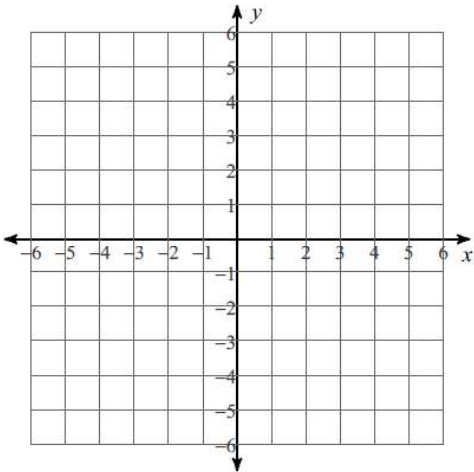
7)  $x = -2$



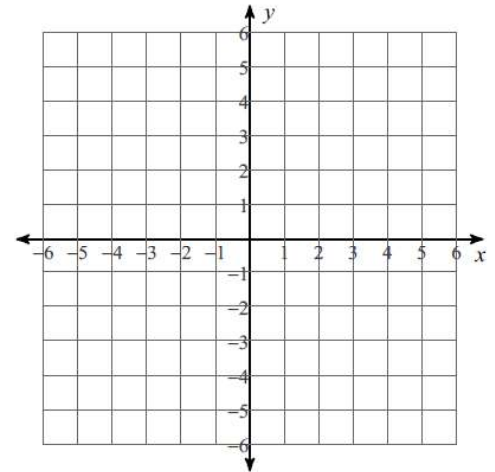
8)  $y = -\frac{1}{5}x - 4$



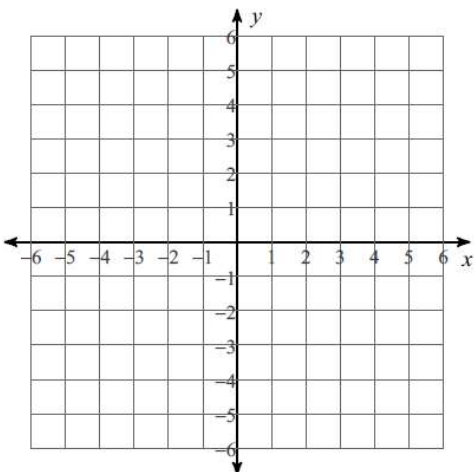
9)  $y = 2$



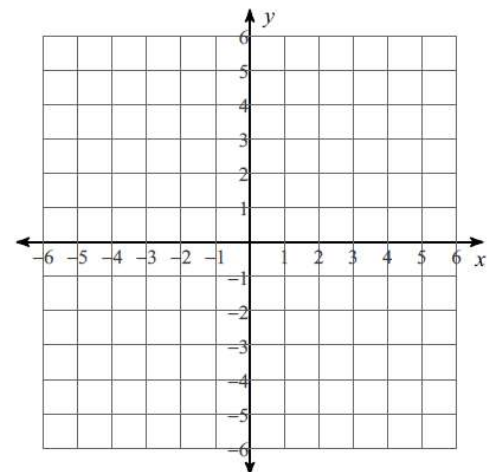
10)  $y = 5x$



11)  $y = \frac{2}{5}x - 3$



12)  $x = 3$



## Graphing in Standard Form

**Standard Form:**  $Ax + By = C$ **Step 1:** Convert from standard form to slope-intercept form (solve for y)**Step 2:** Follow the same steps from graphing in slope-intercept form (pa. 3)**Example:**  $2x + 6y = 12$ 

$$2x + 6y = 12$$

$$\frac{-2x}{6} = \frac{-2x + 12}{6}$$

$$6y = -2x + 12$$

$$\frac{6y}{6} = \frac{-2x + 12}{6}$$

$$y = -\frac{2}{6}x + \frac{12}{6}$$

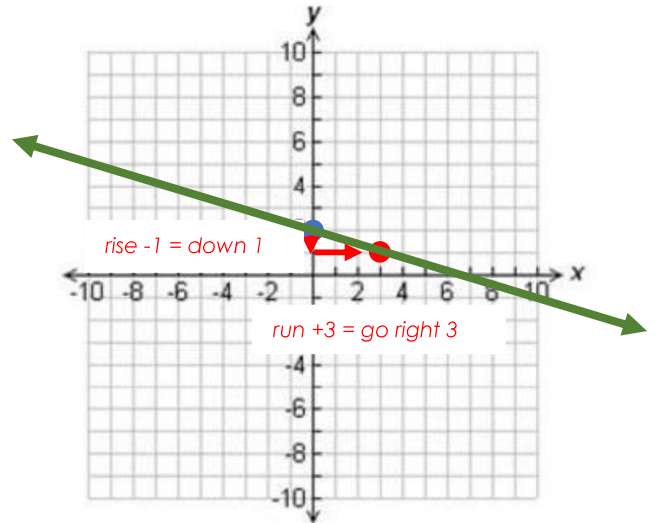
$$y = -\frac{1}{3}x + 2$$

$$b = 2$$

$$y\text{-int: } (0, 2)$$

$$m = -\frac{1}{3}$$

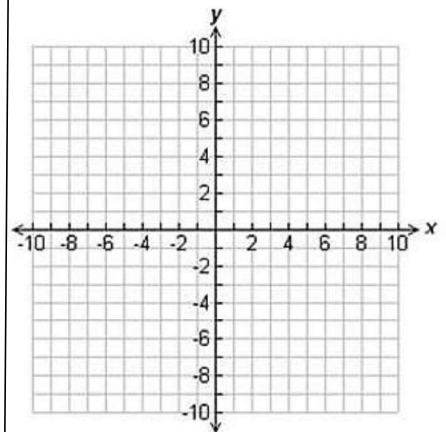
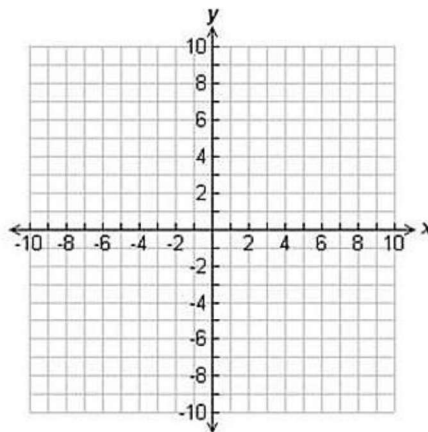
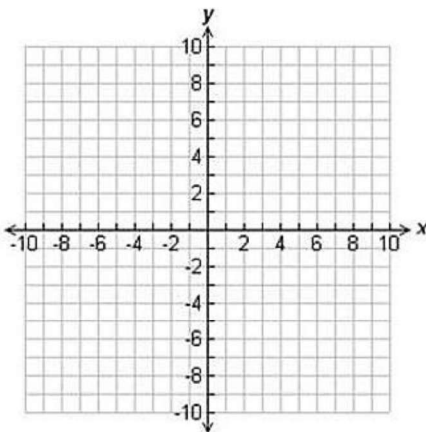
$$m = \frac{\text{rise}-1}{\text{run}+3} = \frac{\text{down } 1}{\text{right } 3}$$

**Practice**

$2x + 8y = -24$

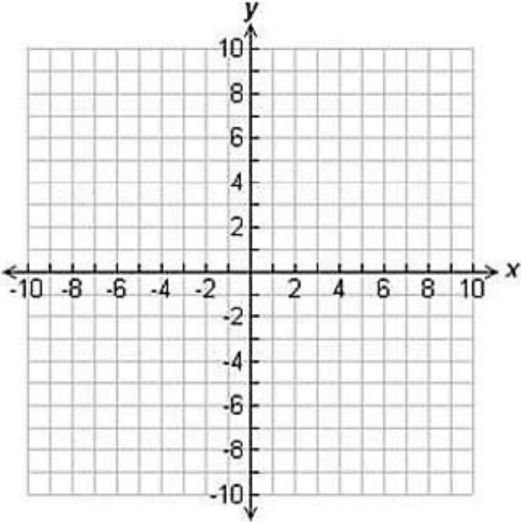
$3x - 2y = -12$

$4x - y = 1$

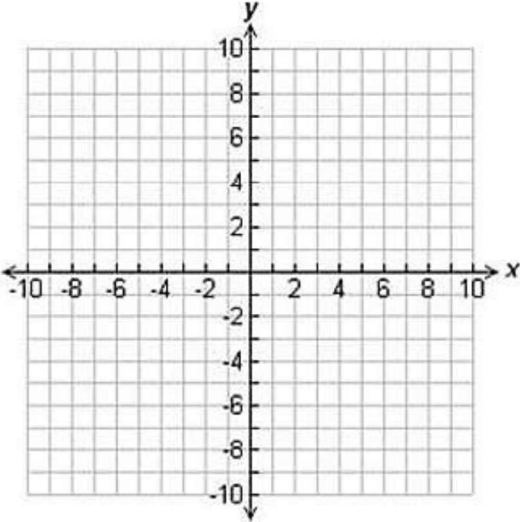


Graphing in Standard Form Practice

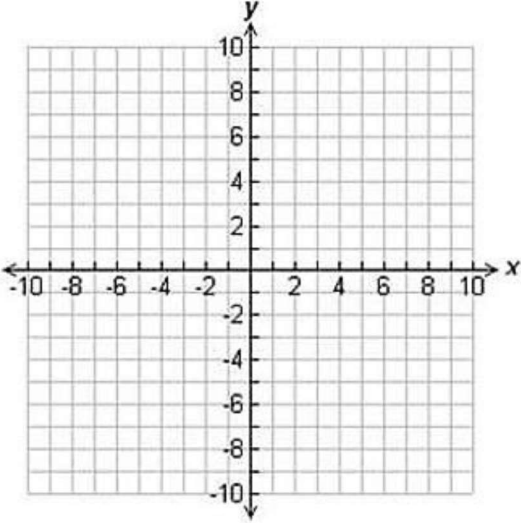
1)  $y = 2x + 5$



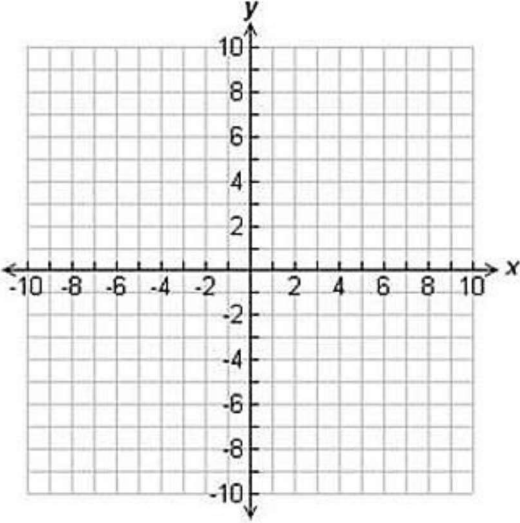
2)  $2y - x = 6$



3)  $2x + 3y = 15$



4)  $3(x + 2) - y + 2 = 14$

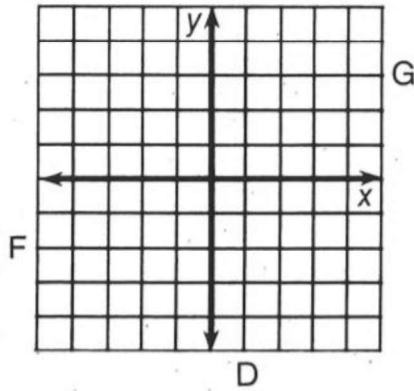




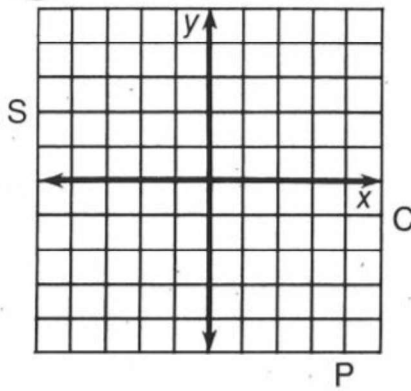
### Why Did the Cow Want a Divorce?

Graph each equation below. The graph, if extended, will cross a letter. Look for this letter in the string of letters near the bottom of the page and CROSS IT OUT each time it appears. When you finish, write the remaining letters in the rectangle at the bottom of the page.

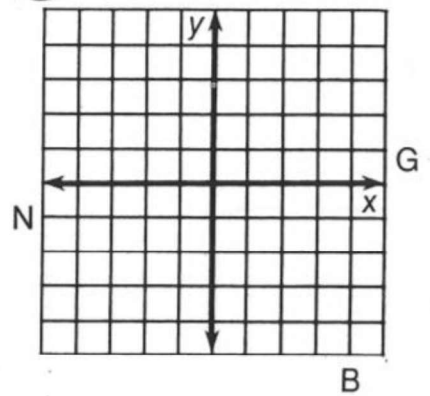
①  $y = -2$



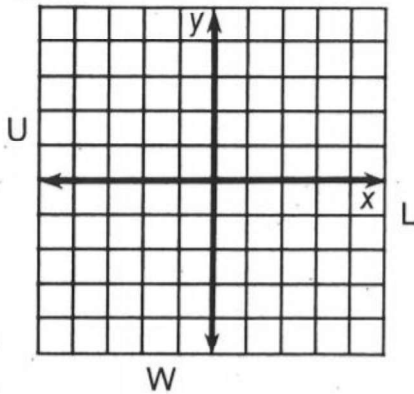
②  $x = 4$



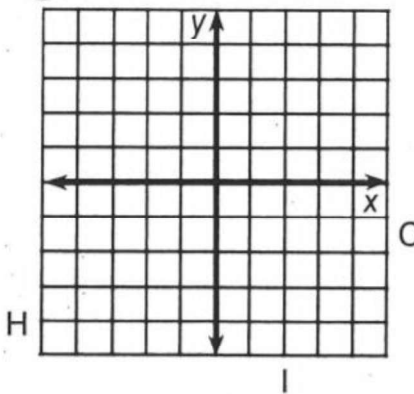
③  $2x - 3y = 9$



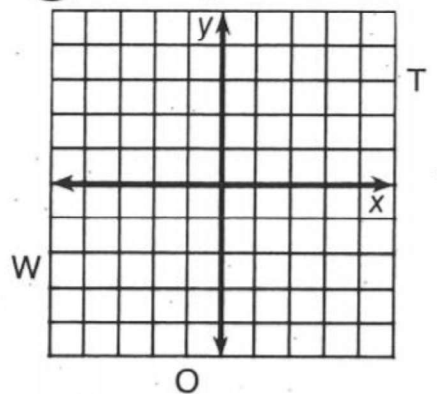
④  $x + 2y - 4 = 0$



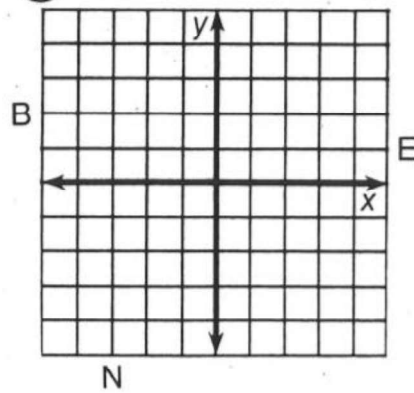
⑤  $3x + 4y = 12$



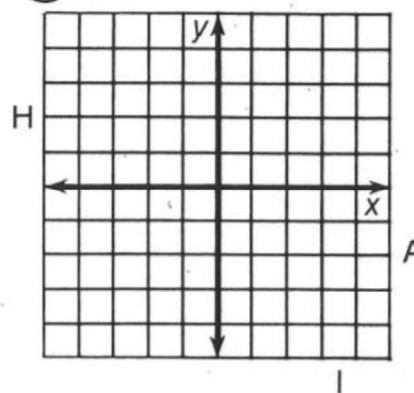
⑥  $6x - 5y + 20 = 0$



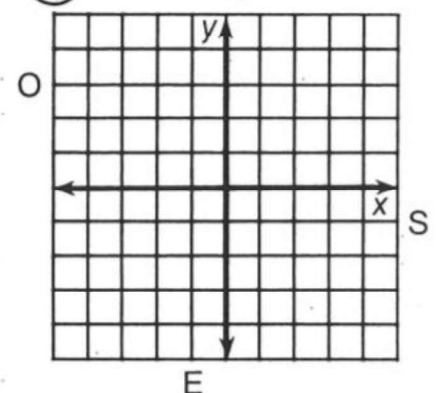
⑦  $x + 3 = 0$



⑧  $2x - 7 = 0$



⑨  $-2x = 2y + 5$



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Answer: \_\_\_\_\_

Work for Why Did the Cow Want a Divorce?

1)	2)	3)
4)	5)	6)
7)	8)	9)