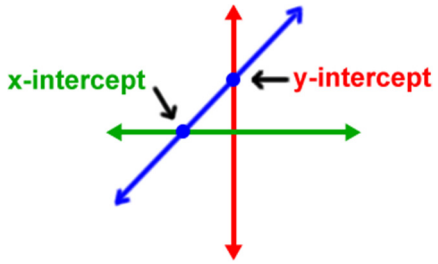
Unit 2 Notes

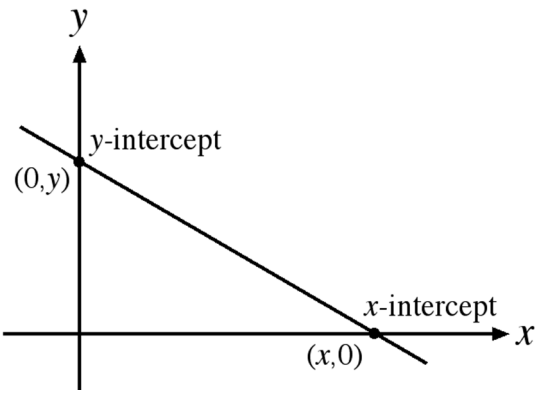
Use the words below to match with its correct definition.

Linear Equation Slope *y*-intercept *x*-intercept

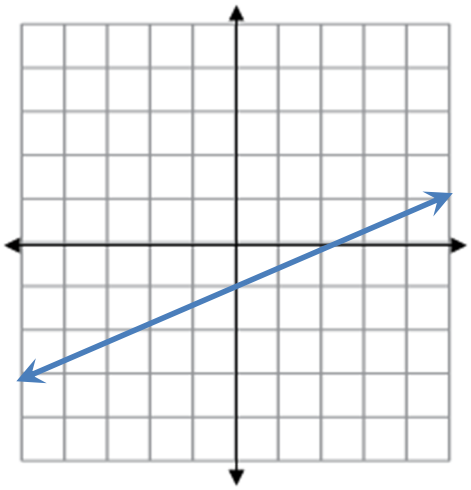
Slope-intercept Form Standard Form

Vocabulary Word	Definition	Example
	An equation whose graph is a straight line	
	The steepness of a line or the rate of change	
	The x-coordinate where the graph crosses the x-axis	
	The y-coordinate where the graph crosses the y-axis	
	An equation in the form $y = mx + b$	
	An equation in the form $Ax + By = C$	

Finding Intercepts from the Graph

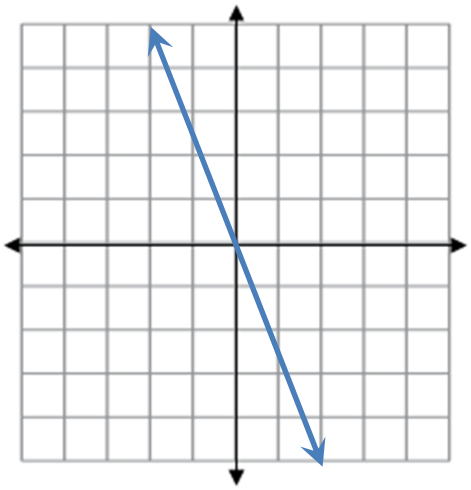


State the x and y-intercept for each graph.



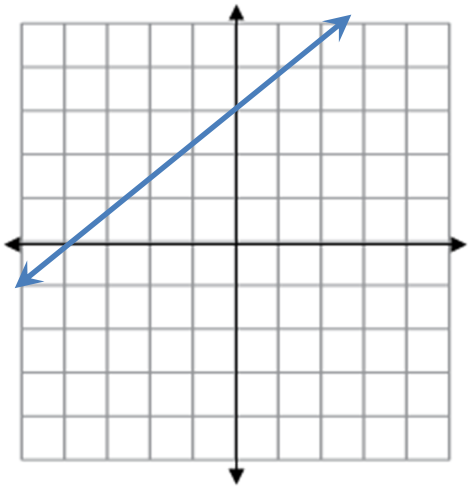
x-intercept = _____

y-intercept = _____



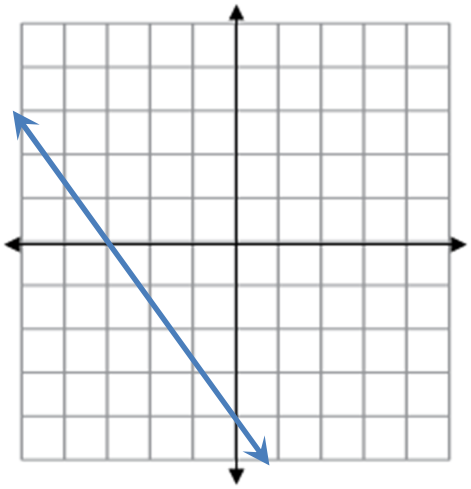
x-intercept = _____

y-intercept = _____



x-intercept = _____

y-intercept = _____



x-intercept = _____

y-intercept = _____

Finding Intercepts from the Equation

Finding x-intercept	• Replace y with 0 • Solve for x
Finding y-intercept	• Replace x with 0 • Solve for y

Example One

Find the x-intercept and y-intercept for the linear equation $2x - y = -4$

x-intercept: Substitute 0 in for y and solve.

y-intercept: Substitute 0 in for x and solve.

Example Two

Find the x-intercept and y-intercept for the linear equation $y = 5x + 3$

x-intercept: Substitute 0 in for y and solve.

y-intercept: Substitute 0 in for x and solve.

Try These

Find the x- and y-intercepts of each equation.

1. $y = -3x + 7$

x-intercept = _____

y-intercept = _____

2. $3x + 4y = 24$

x-intercept = _____

y-intercept = _____

3. $y = 10x - 8$

x-intercept = _____

y-intercept = _____

4. $y = -5x$

x-intercept = _____

y-intercept = _____

5. $7y - 3x = -21$

x-intercept = _____

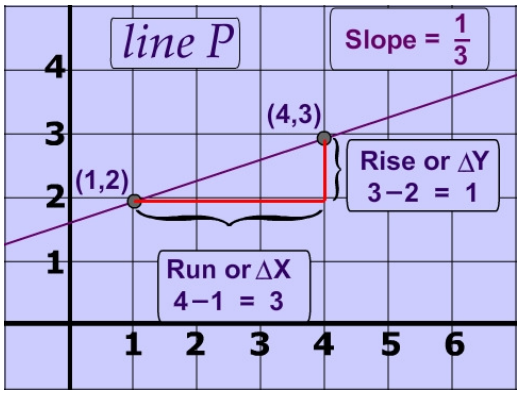
y-intercept = _____

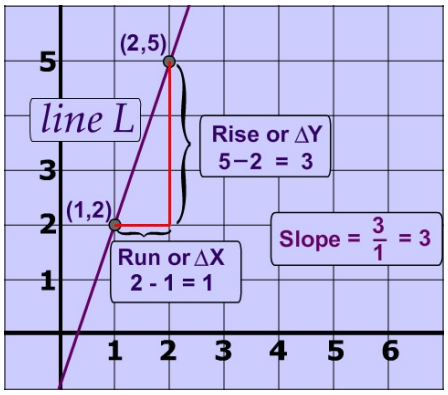
6. $-8x - 4y = 12$

x-intercept = _____

y-intercept = _____

Finding Slope from a Graph





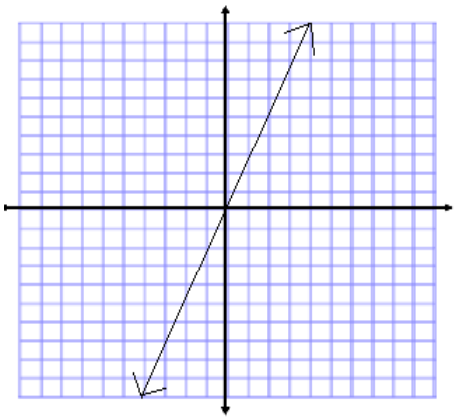
Steps in finding slope from a graph

- Pick two points on the line and state the coordinates.
- Find the rise or change in y
- Find the run or change in x
- The $\text{slope} = \dfrac{\text{rise}}{\text{run}} = \dfrac{\text{change in } y}{\text{change in } x}$

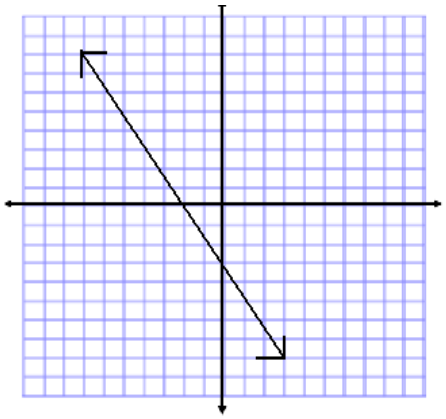
Examples

Find the slope of each line.

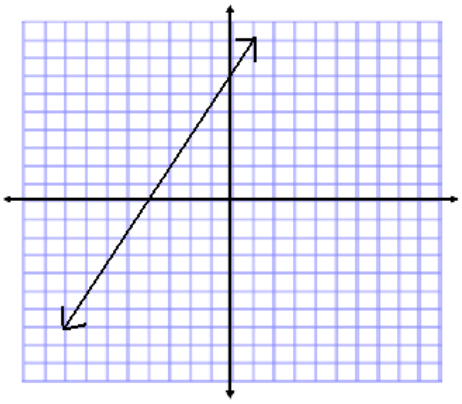
1.



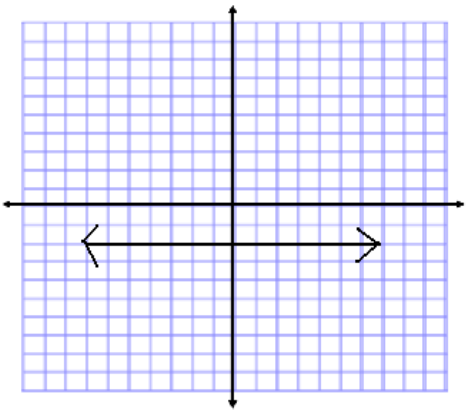
2.



3.

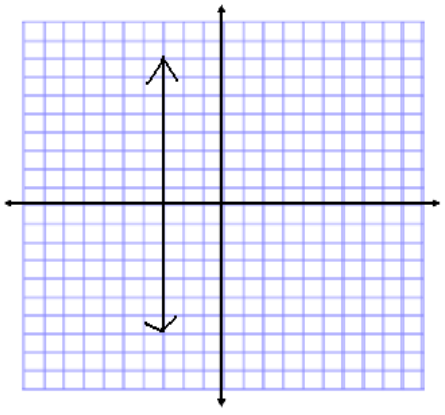


4.



Slope of a horizontal line is _____

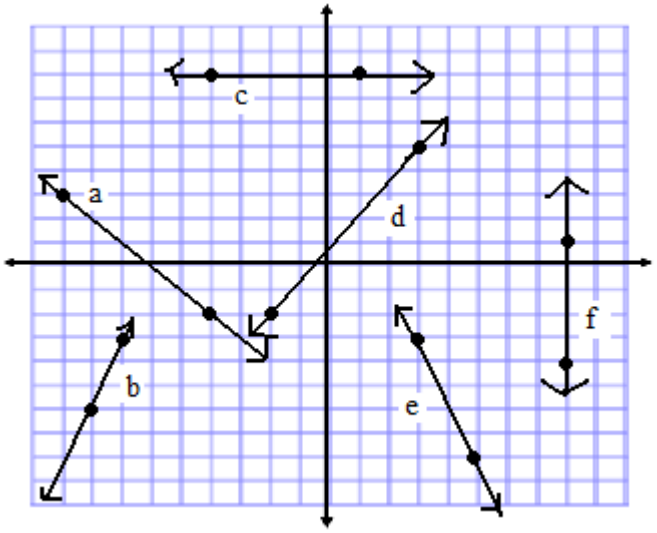
5.



Slope of a vertical line is _____

Try These

Find the slope of each line in the graph.



Line a _____

Line b _____

Line c _____

Line d _____

Line e _____

Line f _____

Finding Slope given Two Points

Slope Formula	Given two points (x_1, y_1) and (x_2, y_2) $$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

Examples

1. Find the slope of the line that goes through the points (2, 4) and (6, 2).

2. Find the slope of the line that contains the points (–2, –5) and (–3, 2).

Try These

Find the slope of the line that contains the following points.

1. (0, 4) and (–5, 6) 1. _____

2. (–1, 3) and (1, 7) 2. _____

3. (4, –2) and (6, 8) 3. _____

4. (8, 0) and (0, 2) 4. _____

5. (–4, 2) and (–4, 5) 5. _____

6. (–5, 3) and (4, –5) 6. _____

7. (3, 2) and (–7, 2) 7. _____

8. (–5,–8) and (–1, –7) 8. _____

Finding Slope given an Equation

Slope-Intercept Form	The slope-intercept form of a linear equation is $y = mx + b$ where *m* represents the **slope** and *b* represents the ***y*-intercept**.

Examples

Find the slope and *y*-intercept of each equation.

1. $y = 4x - 5$ slope = _____ *y*-intercept = _____
2. $y = -2x + 5$ slope = _____ *y*-intercept = _____
3. $y = x + 8$ slope = _____ *y*-intercept = _____
4. $y = \frac{1}{2}x$ slope = _____ *y*-intercept = _____
5. $y = -\frac{3}{2}x + 12$ slope = _____ *y*-intercept = _____

Try These

Find the slope and *y*-intercept of each equation.

6. $y = x + 4$ slope = _____ *y*-intercept = _____
7. $y = \frac{1}{3}x - 3$ slope = _____ *y*-intercept = _____
8. $y = -3x$ slope = _____ *y*-intercept = _____
9. $y = -\frac{2}{3}x + 7$ slope = _____ *y*-intercept = _____
10. $y = -8x - 1$ slope = _____ *y*-intercept = _____
11. $y = -3$ slope = _____ *y*-intercept = _____

Converting Between Forms of Linear Equations

Converting to Slope-Intercept Form	The slope-intercept form of a linear equation is $y = mx + b$ Steps 1. 2.

Examples

Convert the following equations to slope-intercept form.

1. $x + y = 8$
2. $2x - y = -3$
3. $3x - 2y = 6$
4. $6 = -2x - 2y$
5. $4x - 5y = 20$
6. $6x - 8 = 2y + 6$
7. $7x + 2y + 14 = 0$
8. $2x - 2y = x + 6$
9. $y - 6 = -2(x + 3)$
10. $y + 3 = 0.5(x - 8)$

Converting to Standard Form

The standard or general form of a linear equation is

$$Ax + By = C$$

Steps

1.

2.

3.

Examples

Convert the following equations to standard form.

1. $y = -3x + 6$

2. $2x = 5y - 12$

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

4. $y = 4x - \frac{1}{2}$

5. $y = \frac{1}{2}x - 7$

6. $y - 3 = \frac{3}{4}(x - 1)$