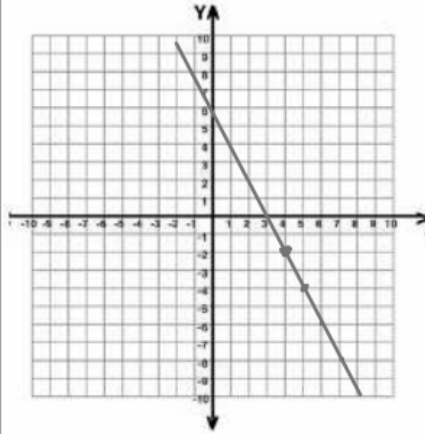


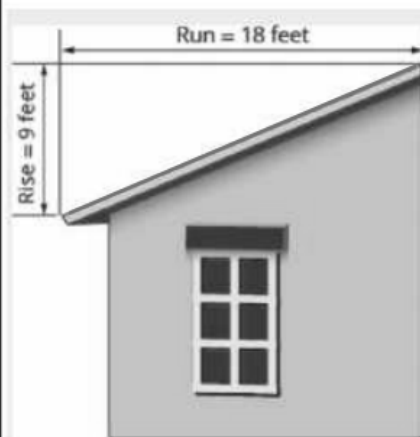
Graph the line passing through the point (4, -2) with a slope of $m = -2$



$$m = -2$$

$$= -\frac{2}{1}$$

The 'pitch' of a building's roof is the slope of the roof. Knowing the pitch is important in climates where there is heavy snowfall. If the roof is too flat, the weight of the snow may cause it to collapse. What is the slope of the roof shown?



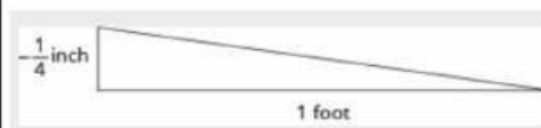
$$\text{Slope} = \frac{\text{rise}}{\text{run}}$$

$$= \frac{9 \text{ ft}}{18 \text{ ft}} = \frac{1}{2}$$

$$\frac{-\frac{1}{4} \text{ in}}{1 \text{ ft}}$$

$$\frac{-\frac{1}{4}}{\frac{12}{1}} = -\frac{1}{48}$$

Have you ever thought about the sewage pipes going from your house to the street? They must slope down $\frac{1}{4}$ inch per foot in order to drain properly. What is the required slope?



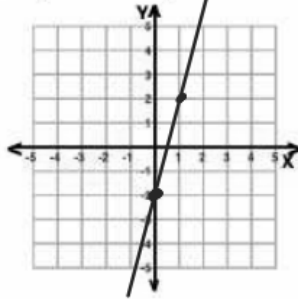
What you will learn about:
Use Slope-Intercept Form of an Equation of a Line

Slope-Intercept form of a line
 $y = mx + b$

$m = \text{Slope}$

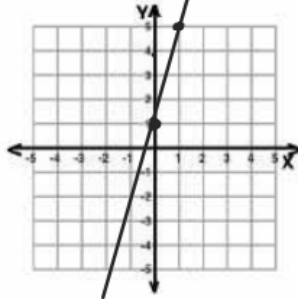
$b \rightarrow \text{y-intercept}$
(Where crosses
y-axis)

Graph the line $y = 4x - 2$ using its slope and y-intercept



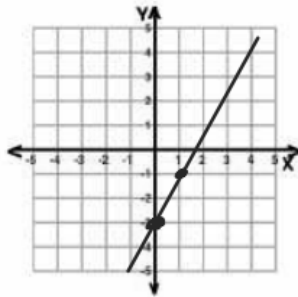
$$m = 4 = \frac{4}{1}$$
$$b = (0, -2)$$

Graph the line $y = 4x + 1$ using its slope and y-intercept



$$\text{Slope} = 4 = \frac{4}{1}$$
$$\text{y-intercept } (0, 1)$$

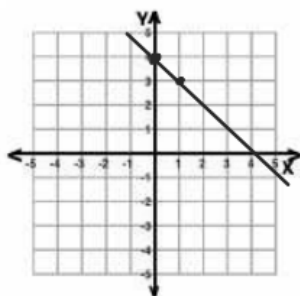
Graph the line $y = 2x - 3$ using its slope and y-intercept



Graph a line using its slope and y-intercept.

1. Step 1. Find the slope-intercept form of the equation of the line.
2. Step 2. Identify the slope and y-intercept.
3. Step 3. Plot the y-intercept.
4. Step 4. Use the slope formula $m = \frac{\text{rise}}{\text{run}}$ to identify the rise and the run.
5. Step 5. Starting at the y-intercept, count out the rise and run to mark the second point.
6. Step 6. Connect the points with a line.

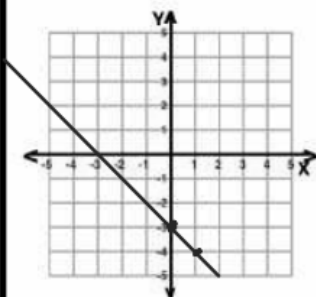
Graph the line $y = -x + 4$ using its slope and y-intercept



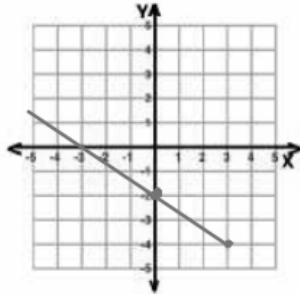
$$m = -1 = \frac{-1}{1}$$

y-intercept (0, 4)

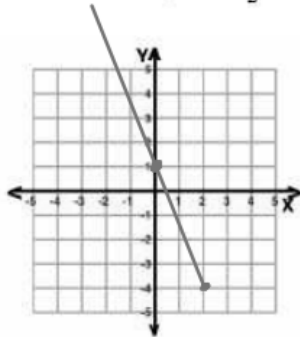
Graph the line $y = -x - 3$ using its slope and y-intercept



Graph the line $y = -\frac{2}{3}x - 2$ using its slope and y-intercept



Graph the line $y = -\frac{5}{2}x + 1$ using its slope and y-intercept

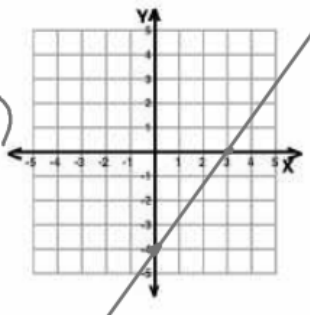


x-inter

$$x = \frac{c}{A} = \frac{12}{4} = (3, 0)$$

$$y = \frac{c}{B} = \frac{12}{-3} = (0, -4)$$

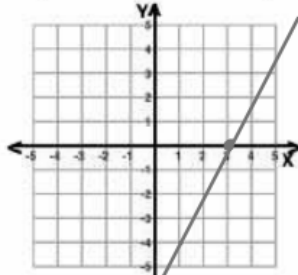
Graph the line of the equation $4x - 3y = 12$



$$\frac{-3y}{-3} = \frac{-4x + 12}{-3}$$

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

Graph the line of the equation $2x - y = 6$



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

$$y = 2x - 6$$

$$m = \frac{2}{1}$$

$$b = (0, -6)$$

X-intercept

$$x = \frac{6}{2} = 3$$

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

least

Methods to Graph Lines

Point Plotting	Slope-Intercept	Intercepts <i>Standard Form</i>	Recognize Vertical and Horizontal Lines														
<table border="1"> <tr><td>x</td><td>y</td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	x	y							$y = mx + b$	<table border="1"> <tr><td>x</td><td>y</td></tr> <tr><td>0</td><td> </td></tr> <tr><td> </td><td>0</td></tr> </table>	x	y	0			0	
x	y																
x	y																
0																	
	0																
Find three points. Plot the points, make sure they line up, then draw the line.	Find the slope and y-intercept. Start at the y-intercept, then count the slope to get a second point.	Find the intercepts and a third point. Plot the points, make sure they line up, then draw the line.	The equation has only one variable. $x = a$ vertical \rightarrow No Y $y = b$ horizontal \rightarrow No X														

$$x = \frac{c}{a}, y = \frac{c}{b}$$

$$m = \frac{A}{B}$$

STRATEGY FOR CHOOSING THE MOST CONVENIENT METHOD TO GRAPH A LINE

Consider the form of the equation.

- If it only has one variable, it is a vertical or horizontal line
 - $x = a$ is a vertical line passing through the x-axis at a .
 - $y = b$ is a horizontal line passing through the y-axis at b .
- If y is isolated on one side of the equation, in the form $y = mx + b$, graph by using the slope and y-intercept
 - Identify the slope and y-intercept and then graph.
- If the equation is of the form $Ax + By = C$, find the intercepts.
 - Find the x- and y-intercepts, a third point, and then graph.

Determine the most convenient method to graph each line.

- $y = -6 \rightarrow$ Horizontal (No X)
- $5x - 3y = 15 \rightarrow$ Intercepts
- $x = 7$ Vertical (No Y)
- $y = \frac{2}{5}x - 1$ slope
y-intercept

$$F = \frac{9}{5}(0) + 32$$

$$= 0 + 32$$
$$= 32^\circ \text{F}$$

$$F = \frac{9}{5}(20) + 32$$

$$36 + 32$$
$$68^\circ \text{F}$$

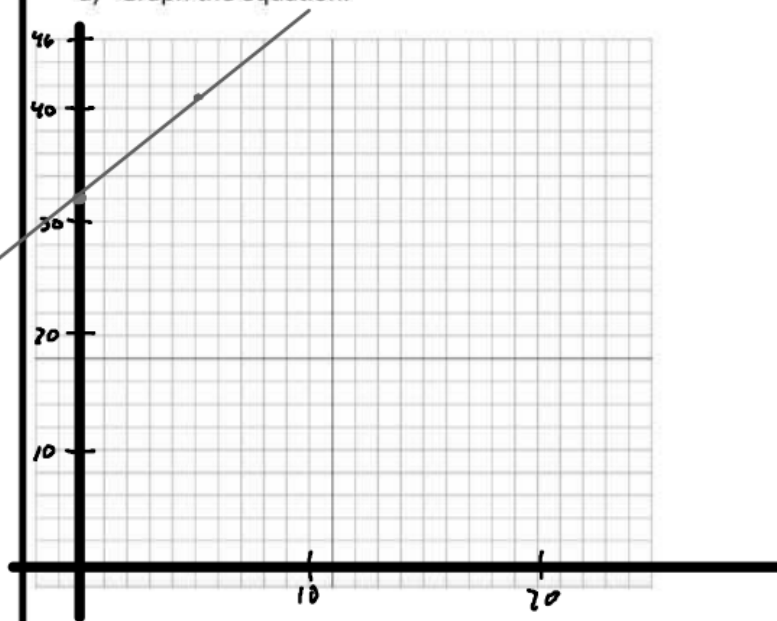
$$\frac{9}{5} \quad \frac{18}{10}$$

The equation $F = \frac{9}{5}C + 32$ is used to convert temperatures, C , on the Celsius scale to temperature, F , on the Fahrenheit scale.

- Find the Fahrenheit temperature for a Celsius Temperature of 0.
- Find the Fahrenheit temperature for a Celsius Temperature of 20.
- Interpret the slope and F-intercept of the equation.

Every time C increase by 5, F increase by 9. When $C=0$ $F=32^\circ$

- F increase by 1.8
- Graph the equation.



The equation $h = 2s + 50$ is used to estimate a woman's height in inches, h , based on her shoe size, s .

- Estimate the height of a child who wears women's shoe size 0.
- Estimate the height of a child who wears women's shoe size 8.
- Interpret the slope and h -intercept of the equation
- Graph the equation