QUICK GRAPHS OF LINEAR EQUATIONS

slope-intercept form: $y = mx + b$

slope *y-intercept* (where the line crosses the y-axis)

a) The slope of a **horizontal line** is 0.

b) The **equation** of a horizontal line is y = #.

c) The slope of a **vertical line** is undefined.

d) The **equation** of a vertical line is x = #.

Graphing Equations in Slope-Intercept Form

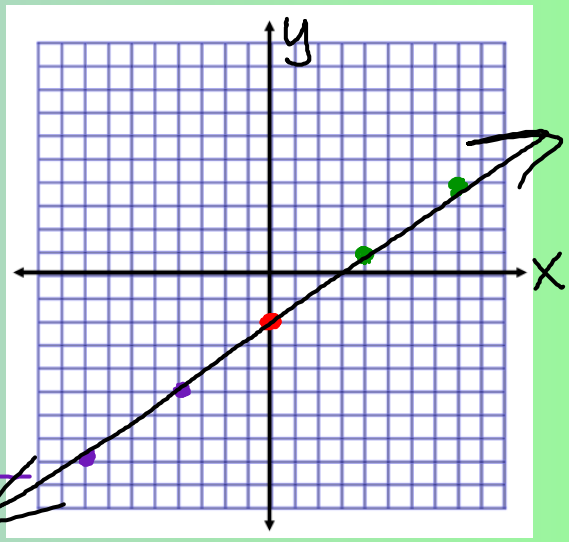
1. Write the equation in slope-intercept form (solve for y).
2. Find the y-intercept and use it to plot the point where the line crosses the y-axis.
3. Find the slope and use it to plot a second point.
4. Draw a line through the two points.

Examples

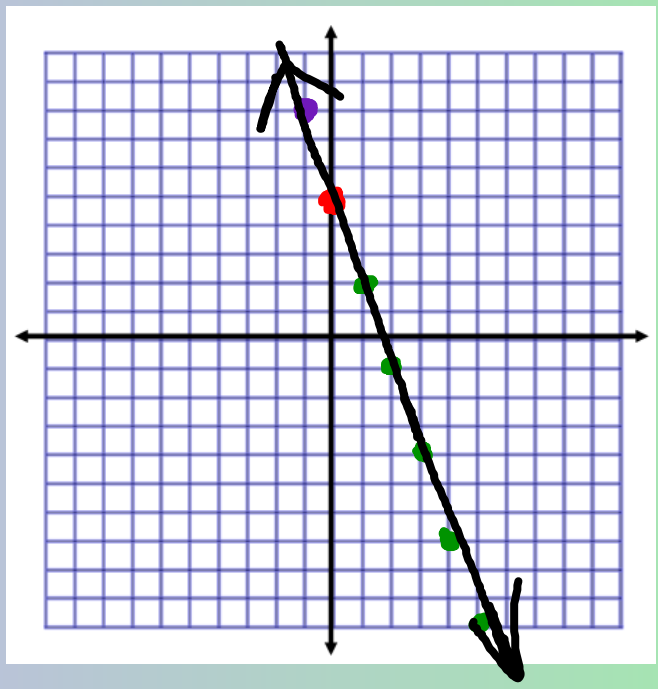
1. Graph $y = \frac{3}{4}x - 2$.

b = -2

$m = \frac{3}{4}$ ↑ 3 ↓ 4 → ←



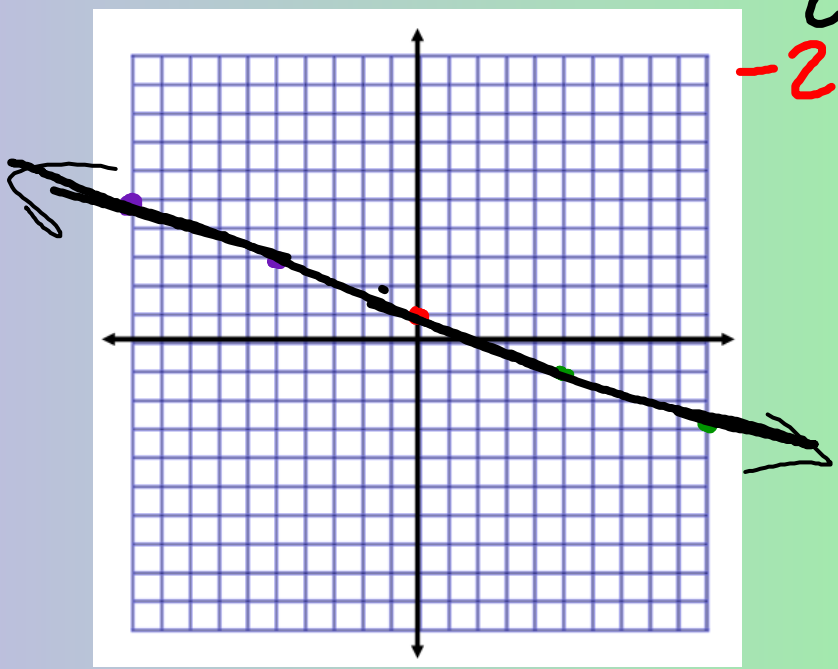
2. Graph $y = -3x + 5$.



$b = 5$

$m = -3 = \frac{-3}{1}$ ↓ ↑ → ←

3. Graph $2x + 5y = 5$.



$2x + 5y = 5$

$-2x \quad -2x$

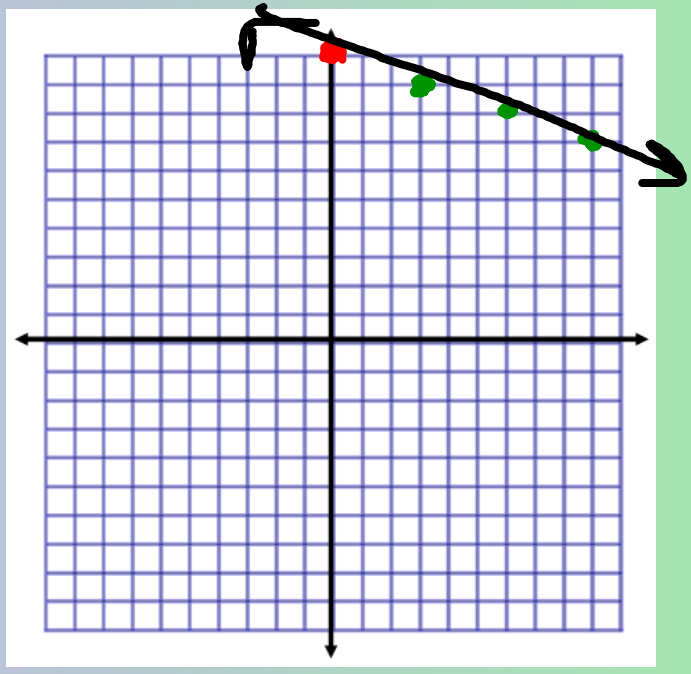
$\frac{5y}{5} = \frac{-2x}{5} + \frac{5}{5}$

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

$b = 1$

$m = \frac{-2}{5}$ ↓ ↑ → ←

4. Graph $3y - 18 = -x + 12$.



$3y - 18 = -x + 12$

$+18 \quad +18$

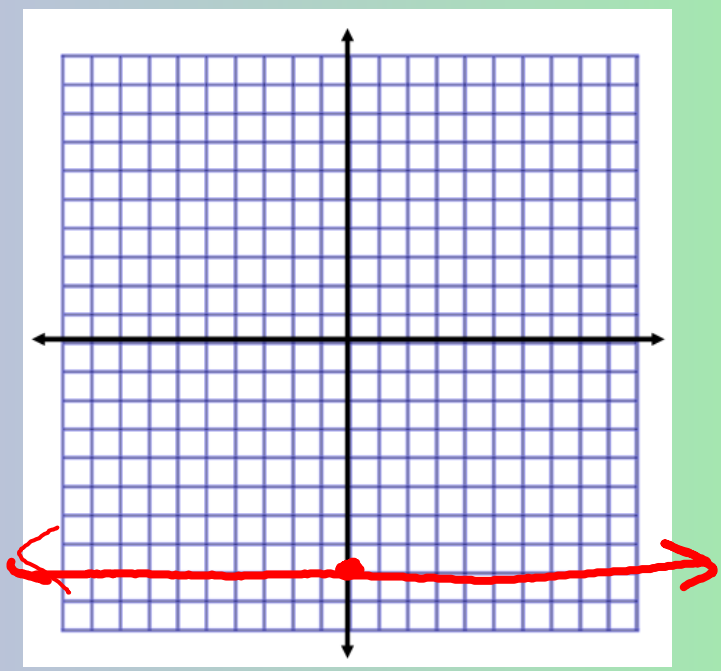
$\frac{3y}{3} = \frac{-x}{3} + \frac{30}{3}$

$y = -\frac{1}{3}x + 10$

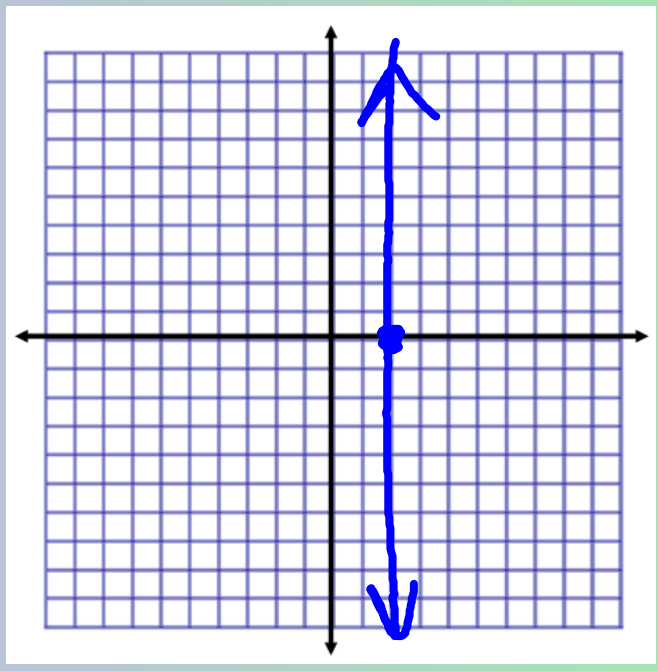
$b = 10$

$m = -\frac{1}{3}$ ↓ →

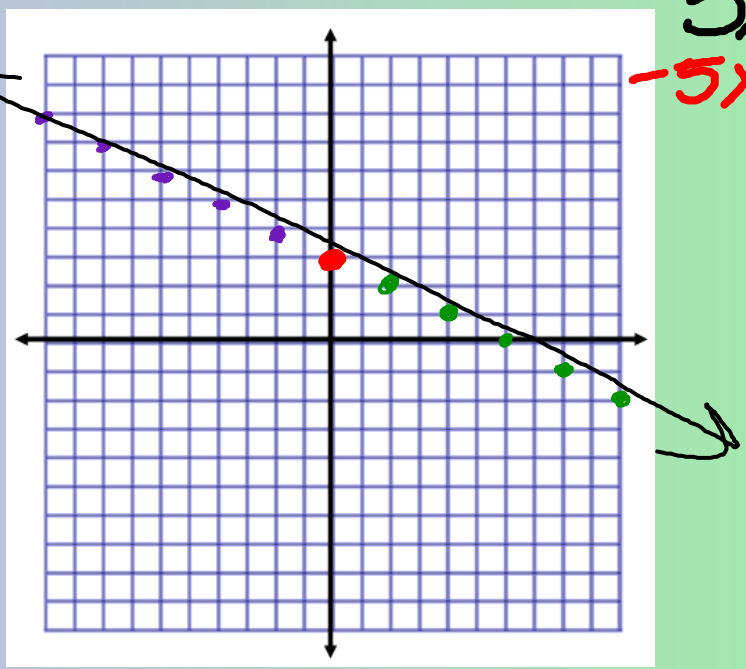
5. Graph $y = -8$.



6. Graph $x = 2$.



7. Graph $5x + 10y = 30$.



$5x+10y=30$

$-5x \qquad -5x$

$\frac{10y}{10} = \frac{-5x}{10} + \frac{30}{10}$

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

$b = 3$

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

Another option to graph $5x + 10y = 30$ is to graph using the intercepts.

x-intercept: where it crosses the x-axis
Set $y = 0$ and solve.

$5x + 10(0) = 30 \Rightarrow \frac{5x}{5} = \frac{30}{5}$

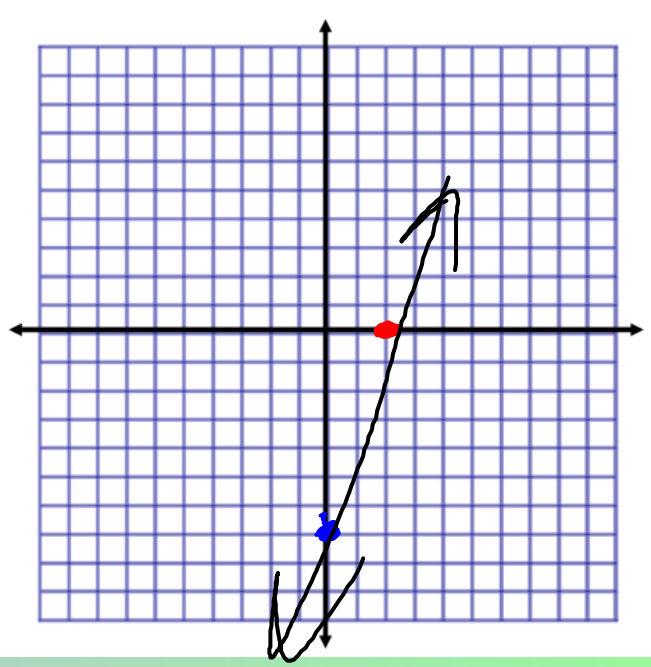
$x = 6$

y-intercept: where it crosses the y-axis
Set $x = 0$ and solve.

$5(0) + 10y = 30 \Rightarrow \frac{10y}{10} = \frac{30}{10}$

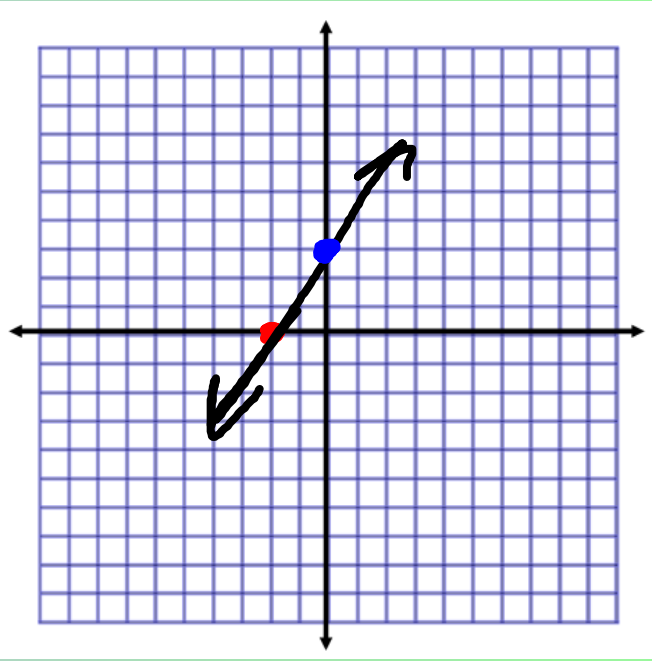
$y = 3$

8. Draw the line with the given intercepts.
x-intercept: 2
y-intercept: -7



9. Graph by finding the intercepts.

$3x - 2y = -6$



x-int: $3x-2(0)=-6$

(y=0)

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

$x=-2$

y-int: $3(0)-2y=-6$

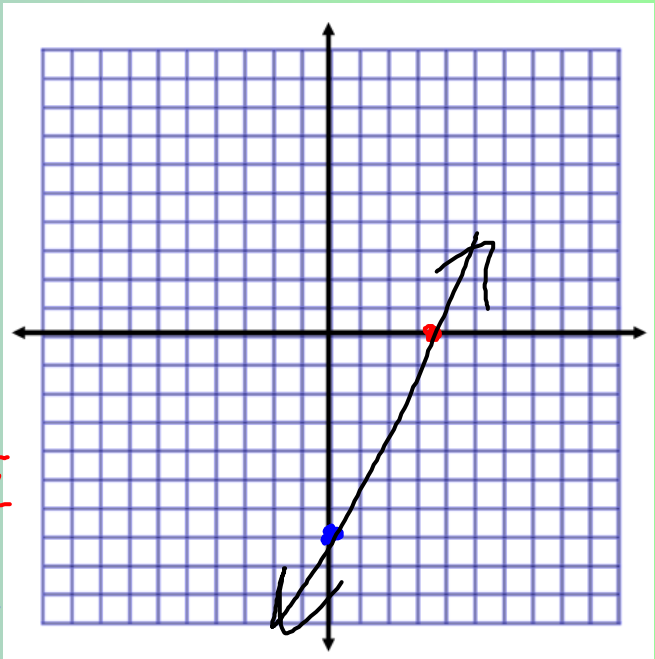
(x=0)

$\frac{-2y}{-2}=\frac{-6}{-2}$

$y=3$

10. Graph by finding the intercepts.

$-4x + 2y = -14$



x-int $-4x+2(0)=-14$

(y=0)

$\frac{-4x}{-4}=\frac{-14}{-4}$

$x=\frac{7}{2}=3\frac{1}{2}$

y-int: $-4(0)+2y=-14$

(x=0)

$\frac{2y}{2}=\frac{-14}{2}$

$y=-7$