More with Writing Linear Equations

Write an equation of a line through the given point with the given slope.	
Example: (-1, 5); $b = -\dfrac{3}{5}$ Recall: $y = a + bx$ First solve for "a" by plugging in –1=x, 5=y, -3/5=b $5 = a + (-3/5)(-1)$ $5 = a + (3/5)$ $\underline{-3/5 \qquad - 3/5}$ $17/5 = a$ Now, plug in the values for "a" and "b" to get the final equation. $y = \dfrac{17}{5} - \dfrac{3}{5}x$ Final Answer!	1.) (3, -4); $b = \dfrac{-2}{5}$
2.) (5, 1); $b = \dfrac{1}{4}$	3.) (1, -2); $b = 4$

Write an equation of a line through the given points.	
Example: (2, 4), (4, 7) Recall: $y = a + bx$ First solve for "b" by using the slope formula. $b = \dfrac{7 - 4}{4 - 2} = \dfrac{3}{2}$ Now solve for "a" by plugging in 2=x, 4=y, 3/2=b $4 = a + (3/2)(2)$ $4 = a + 3$ $\dfrac{-3 \qquad -3}{1 = a}$ Now, plug in the values for "a" and "b" to get the final equation. $\left(y = 1 + \dfrac{3}{2}x\right)$ Final Answer!	4.) (-4, 5), (-1, -3)
5.) (5, -2), (-7, -8)	6.) (-1, 1), (-4, -3)

Something New!

Ax + By = C

The slope-intercept (y = a +bx) is just one form of a linear equation. Another form is Ax + By = C, which is useful in making quick graphs.

To make a quick graph, you can use the *x*- and *y*- intercepts.

Example:
Graph 3x + 4y = 8

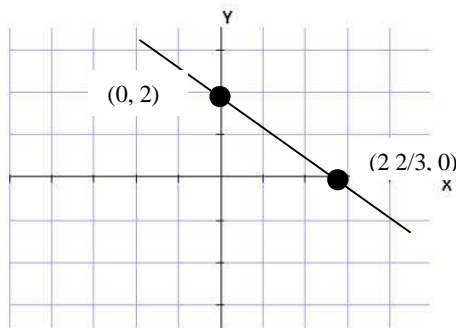| Step 1: To find the x-intercept, substitute 0 for *y* and solve for *x*.	Step 2: To find the y-intercept, substitute 0 for *x* and solve for *y*.
$3x + 4y = 8$ $3x + 4(0) = 8$ $3x = 8$ $x = \dfrac{8}{3}$ or 2 2/3 So, when y = 0, x = 2 2/3 Or the coordinate would be (2 2/3, 0)	$3x + 4y = 8$ $3(0) + 4y = 8$ $4y = 8$ $y = 2$ So, when x = 0, y = 2 Or the coordinate would be (0, 2)

Step 3:
Plot (2 2/3, 0) and (0, 2)
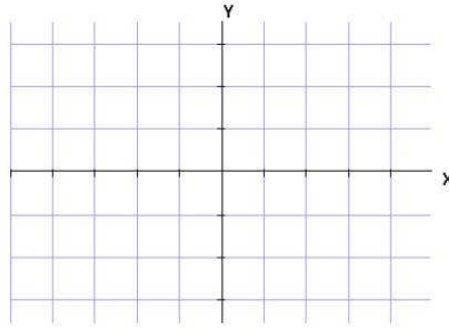Draw a line through the points.

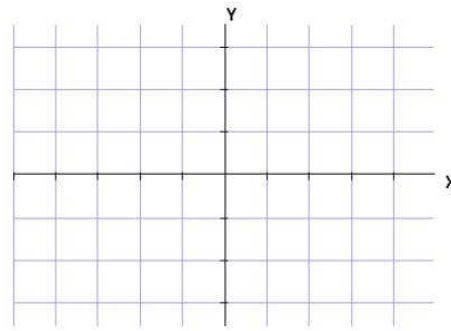| **Find the x- and y-intercepts for each equation. And then graph the line.** |
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7.) 3x + 4y = 12
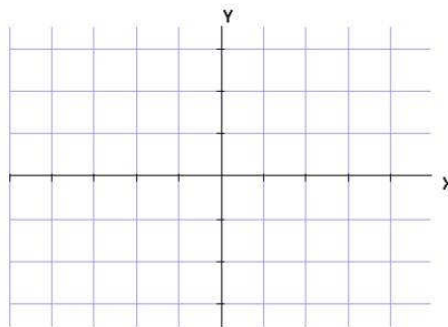
8.) $2x + 5y = -10$

9.) $-x + 2y = 4$

Convert the "Ax +By = C" equation to the "y = a + bx" equation

$5x - 3y = 120$ Subtract –5x from both sides of the equal sign.
$\underline{-5x \qquad -5x}$
$\quad -3y = 120 - 5x$ Divide by –3 on both sides of the equal sign. So, $120 \div -3$ AND $-5x \div -3$.
$\quad \div -3 \qquad \div -3$

$y = 40 - \dfrac{5x}{3}$

10.) $2x - 5y = 10$

11.) $2x - y = 8$