In #41-42, we must first find the slope. Then we can use either point to help us find b.

Given two points on a line, find the equation of the line by first finding its slope.

41. (-6, 4) and (12, 7)

Slope: $m = \frac{7-4}{12-(-6)} = \frac{3}{12+6} = \frac{3}{18}$

$m = \frac{1}{6}$

Let's use the point $(\overset{x}{-6}, \overset{y}{4})$:

$y = mx + b$

$4 = \frac{1}{6} \cdot \frac{-6}{1} + b$

$4 = -1 + b$

$+1 = +1$

$5 = b$

So, $\boxed{y = \frac{1}{6}x + 5}$

42. (-6, -2) and (-9, -10)

Slope: $m = \frac{-10-(-2)}{-9-(-6)} = \frac{-10+2}{-9+6} = \frac{-8}{-3} = \frac{8}{3}$

Let's use (-6, -2):

$y = mx + b$

$-2 = \frac{8}{3} \cdot \frac{(-6)}{1} + b$

$-2 = \frac{8}{1} \cdot \frac{(-2)}{1} + b$

$-2 = -16 + b$

$+16 = +16$

$14 = b$

$\boxed{y = \frac{8}{3}x + 14}$

If we used the point (-9, -10) instead, we get this:

$y = mx + b$

$-10 = \frac{8}{3} \cdot \frac{-9}{1} + b$

$-10 = \frac{8}{1} \cdot \frac{-3}{1} + b$

$-10 = -24 + b$

$+24 = +24$

$14 = b$

$\boxed{y = \frac{8}{3}x + 14}$

same answer.

Write each equation in standard form.

43. $y = 2x + 8$

44. $y = -\frac{4}{5}x - 7$

Standard Form is $Ax + By = C$, where ① A is not negative ② A, B, and C are integers (no fractions)

#43

$y = 2x + 8$

$-2x = -2x$

$-2x + y = 8$ (notice that the x-term is first)

Because A is negative we must multiply each side by -1:

$-1(-2x + y) = -1 \cdot (8)$

$\boxed{2x - y = -8}$

#44 First multiply each side by 5 to clear the fraction:

$5 \cdot y = 5 \cdot \left(-\frac{4}{5}x - 7\right)$

$5y = -4x - 35$

$+4x \quad +4x$

$\boxed{4x + 5y = -35}$

slope-intercept form: $y = mx + b$ Solve for y.

Write each equation in slope-intercept form. Also, identify the *y*-intercept point and the slope.

45. $x + 3y = -12$

$-x \quad = -x$

$3y = -x - 12$ divide each side by 3. Split the right side into two fractions

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

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

$y = -\frac{x}{3} - 4$ ← $-\frac{x}{3} = \frac{-1x}{3} = -\frac{1}{3}x$

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

Also, slope, $m = -\frac{1}{3}$

y-int. point: $(0, -4)$

46. $5x - 2y = -6$

$-5x \quad = -5x$

$-2y = -5x - 6$ divide each side by -2: split the right side into two fractions.

$\frac{-2y}{-2} = \frac{-5x-6}{-2}$

$y = \frac{-5x}{-2} - \frac{6}{-2}$

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

$y = \frac{5}{2}x + 3$

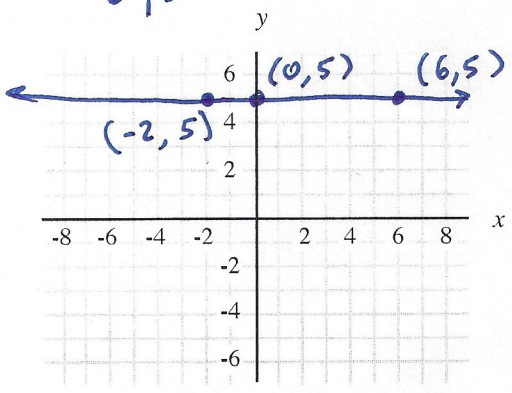
Also, $m = \frac{5}{2}$ and y-int. pt: $(0, 3)$

Graph each line.

47. $y = 5$

When all we know is $y = 5$, x can be any number:

x	y	
-2	5	(-2, 5)
0	5	(0, 5)
6	5	(6, 5)

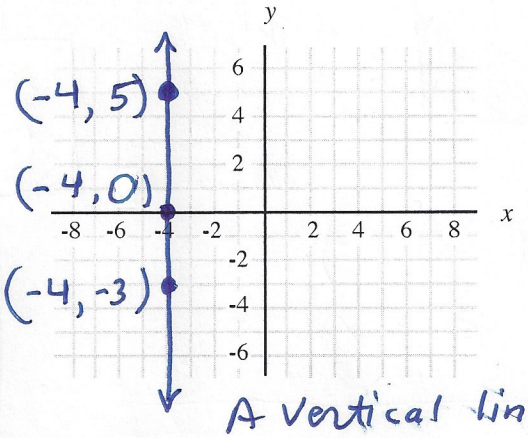


A horizontal line

48. $x = -4$

When all we know is $x = -4$, y can be any number:

x	y	
-4	5	(-4, 5)
-4	0	(-4, 0)
-4	-3	(-4, -3)



A vertical line