Algebra II   Worksheet #4   Unit 2   selected solutions   page 1

For each of the following linear equations in two variables: (a) find the x and y intercepts, (b) write the equation in slope-intercept form, and (c) graph the equation.

1.   2x + 3y = 12

(a)   x intercept: 6   y intercept: 4 .

The x-intercept is the value of x when y = 0.   The y-incercept is the value of y when x = 0.
Just let y = 0, and solve for x.   Just let x = 0, and solve for y.

$$2x + 3(0) = 12 \qquad\qquad\qquad\qquad\qquad 2(0) + 3y = 12$$
$$2x = 12 \qquad\qquad\qquad\qquad\qquad\qquad 3y = 12$$
$$x = 6 \qquad\qquad\qquad\qquad\qquad\qquad\quad y = 4$$

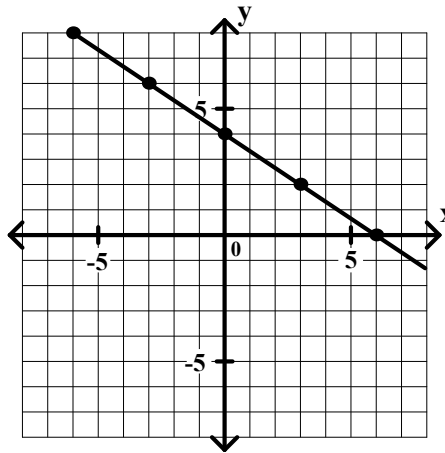**(b)   slope intercept equation:** $y = \dfrac{-2}{3}x + 4$

To find the slope-intercept equation, just solve for y.

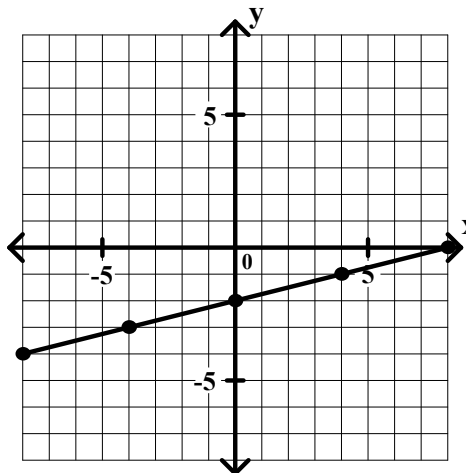$$2x + 3y = 12$$
$$3y = -2x + 12$$
$$y = \dfrac{-2}{3}x + 4$$

(c)

Graph each of the following equations in the Cartesian coordinate plane.

8.   x − 4y = 8

$$-4y = -x + 8$$
$$y = \dfrac{1}{4}x - 2$$

Write the equation of each line described. If the line is oblique, use slope-intercept form.

14. The vertical line through (-4, -3). $x = -4$.

17. The line with slope 3/4 and y-intercept -3. $y = \dfrac{3}{4}x - 3$

19. The line through (0, -3) and (2, 4). $y = \dfrac{7}{2}x - 3$

$m = \dfrac{4 + 3}{2 - 0} = \dfrac{7}{2}$ $b = -3$

20. The line with slope -1/4 through (-4, -3). $y = \dfrac{-1}{4}x - 4$

$y + 3 = \dfrac{-1}{4}(x + 4)$

$y + 3 = \dfrac{-1}{4}x - 1$

24. The line through (-4, 5) and (2, -3). $y = \dfrac{-4}{3}x - \dfrac{1}{3}$

$m = \dfrac{-3 - 5}{2 + 4} = \dfrac{-4}{3}$ $y + 3 = \dfrac{-4}{3}(x - 2)$

$y + 3 = \dfrac{-4}{3}x + \dfrac{8}{3}$

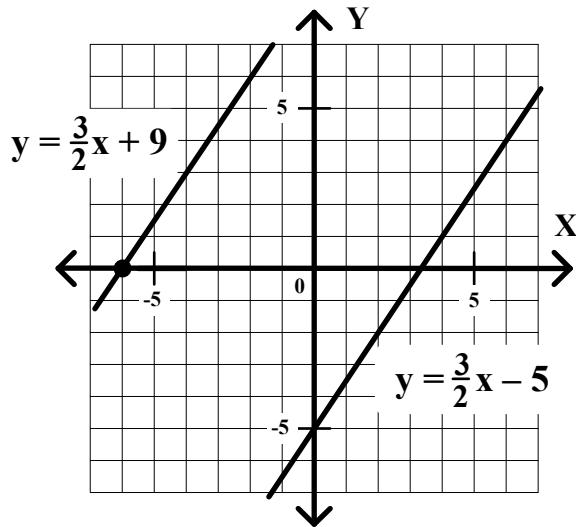# Algebra II   Worksheet #4   Unit 2   selected solutions page 3

Find the equation of each line described below. If the line is oblique, write the slope-intercept equation. Graph both equations (the given equation as well as your solution).

34. Through (-6 , 0) parallel to $3x - 2y = 10$

$m_2 = \frac{3}{2}$

$y - 0 = \frac{3}{2}(x + 6)$

$-2y = -3x + 10$

$y = \frac{3}{2}x - 5$ **first**

$m_1 = \frac{3}{2}$

$\boxed{y = \frac{3}{2}x + 9}$

$y = \frac{3}{2}x + 9$

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

40. Through (-6 , 0) perpendicular to $3x - 2y = 10$

$m_2 = \frac{-2}{3}$

$y - 0 = \frac{-2}{3}(x + 6)$

$-2y = -3x + 10$

$y = \frac{3}{2}x - 5$ **first**

$m_1 = \frac{3}{2}$

$\boxed{y = \frac{-2}{3}x - 4}$

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

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