

Ex. 1: Write an equation in slope-intercept form of the line with slope $-\frac{3}{4}$ that contains $(-2, 5)$.

$m = -\frac{3}{4}$ $x = -2$ $y = 5$
 $y = mx + b$
 $5 = -\frac{3}{4}(-2) + b$
 $5 = \frac{3}{2} + b$
 $5 - \frac{3}{2} = b$
 $\frac{10}{2} - \frac{3}{2} = b$
 $b = \frac{7}{2}$
 $y = -\frac{3}{4}x + \frac{7}{2}$

Ex. 2: Write an equation of the line through each pair of points in slope-intercept form.

A. $(0, 3)$ and $(-2, -1)$

$m = 2$
 $y = 2x + 3$

$-1 = 2(-2) + b$
 $-1 = -4 + b$
 $3 = b$

B. $(-7, 4)$ and $(9, -4)$

Ex. 3:

A. Write an equation in slope-intercept form for a line parallel to $y = -\frac{3}{4}x + 3$ containing $(-3, 6)$.

$m = -\frac{3}{4}$
 $6 = -\frac{3}{4}(-3) + b$
 $6 = \frac{9}{4} + b$
 $\frac{24}{4} = \frac{9}{4} + b$
 $\frac{24}{4} - \frac{9}{4} = b$
 $b = \frac{15}{4}$
 $y = -\frac{3}{4}x + \frac{15}{4}$

B. Write an equation in slope-intercept form for a line perpendicular to $y = -\frac{3}{4}x + 3$ containing $(-3, 6)$.

$m = \frac{4}{3}$
 $6 = \frac{4}{3}(-3) + b$
 $6 = -4 + b$
 $10 = b$
 $y = \frac{4}{3}x + 10$

C. Write an equation in slope-intercept form for a line perpendicular to $y = 5$ containing $(-3, 6)$.

$m = \text{undefined}$
 $x = -3$

Ex. 4:

- A. Write an equation in slope-intercept form for a line parallel to $6x + 2y = 4$ containing $(4, 0)$.

$$y = -3x + 12$$

$$-6x \quad -6y$$

$$\frac{2y}{2} = \frac{-6x + 4}{2}$$

$$y = -3x + 2$$

$$m = -3$$

$$0 = -3(4) + b$$

$$0 = -12 + b$$

$$12 = b$$

- B. Write an equation in slope-intercept form for a line perpendicular to $6x + 2y = 4$ containing $(4, 0)$.

$$\perp \rightarrow m = \frac{1}{3}$$

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

$$0 = \frac{1}{3}(4) + b$$

$$0 = \frac{4}{3} + b$$

$$b = -\frac{4}{3}$$

- D. Write an equation in slope-intercept form for a line parallel to $y = 5$ containing $(-3, 6)$.

$$y = 6$$

Ex. 5:

- A. Write the equation of a line that contains the point $(12, 15)$ that is parallel to the line containing the points $(-4, -5)$ and $(8, 4)$.

- B. Write the equation of a line that contains the point $(9, -13)$ that is perpendicular to the line containing the points $(-4, -5)$ and $(8, 4)$.

$$m = -\frac{4}{3}$$

$$-13 = -\frac{4}{3}(9) + b$$

$$-13 = -12 + b$$

$$-1 = b$$

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