Lesson 2.4: Writing Equations of Lines

Slope-Intercept Form: $y = mx + b$

Point-Slope Form: $y - y_1 = m(x - x_1)$

Write the equation of the line. $y = mx + b$

Ex: $m = -\dfrac{1}{2}, \ b = -1$

$y = -\dfrac{1}{2}x - 1$

$\boxed{4.}\ m = 3, \ b = 4$

$y = 3x + 4$

Write the equation of the line. $y - y_1 = m(x - x_1)$

Ex: $(5, 3)$, $m = 5$

$$y - 3 = 5(x - 5)$$

14. $(12, 0)$, $m = \dfrac{3}{4}$
    $x_1 \ y_1$

$$y - 0 = \frac{3}{4}(x - 12)$$

$$\boxed{y = \frac{3}{4}(x - 12)}$$

Write the equation of the line.

① $y = mx + b$

② $y - y_1 = m(x - x_1)$

Ex: $(-3, 5)$ Parallel to $y = -2x + 1$

$x_1 \ y_1$

$m = -2$

Parallel lines have the same slope.

$$y - 5 = -2(x - (-3))$$

$$y - 5 = -2(x + 3)$$

28. $(4, 1)$ Perpendicular to $y = \frac{1}{3}x + 3$

$x_1 \ y_1$

$M = -3$

Opposite and reciprocal

$$y - 1 = -3(x - 4)$$

$$\perp \quad y = 5x + 1 \qquad \frac{5}{1}$$

$$m = -\frac{1}{5}$$

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

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

36. Line through $(15, 20)$ and $(-12, 29)$

$x_1 \; y_1$ $x_2 \; y_2$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{29 - 20}{-12 - 15} = \frac{9 \div 9}{-27 \div 9} = -\frac{1}{3}$$

$$y - 20 = -\frac{1}{3}(x - 15)$$