2.4 Equations of Lines

slope-intercept form: $y = mx + b$ pt (x, y) m = slope b = y-int $(0, b)$

point-slope form: $y - y_1 = m(x - x_1)$ (x_1, y_1) given pt

standard form: $Ax + By = C$ $\frac{y-y_1}{x-x_1} = m$

(A, B, and C are integers)

Write the equation of a line in slope-intercept form.

1 line through (-4, -1) with slope = 5 (x_1, y_1; m)

$y = mx + b$

$-1 = 5(-4) + b$

-20

$19 = b$

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

$y + 1 = 5(x + 4)$

$y = 5x + 20 - 1$

$y = 5x + 19$

2 line through (9, 3) and (5, -2)

$m = \frac{5}{4}$

$y = mx + b$

$\frac{3}{1} = \frac{5}{4}(9) + b$

$\frac{12}{4} - \frac{45}{4} = b$

$y = \frac{5}{4}x - \frac{33}{4}$

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

$y - 3 = \frac{5}{4}(x - 9)$

$y = \frac{5}{4}x - \frac{45}{4} + \frac{12}{4}$

3 line through (-6, 5) that is perpendicular to $3x - y = -4$

$3x + 4 = y$

m

$\perp$ slope $= -\frac{1}{3}$

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