2.2/2.3 Slopes and Graphs of Lines

What is *slope*? $\frac{\text{rise}}{\text{run}} = \frac{\updownarrow}{\leftrightarrow} = \frac{\text{change in } y}{\text{change in } x}$

Ex. 1 **Find the slope of a line through (-2, -4) and (3, -1).**

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1-(-4)}{3-(-2)} = \frac{3}{5}$$

Parallel lines have equal slopes.
Perpendicular lines have slopes that are negative reciprocals of each other.

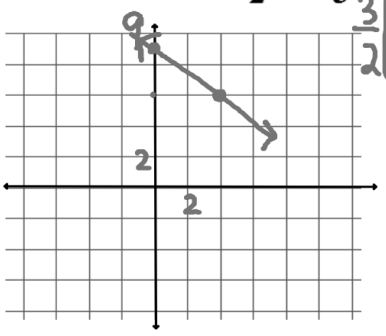
$m_1 \cdot m_2 = -1$

$-4 \cdot \frac{1}{4} = -1$

Ex. 2 **Find the slope (grade) of a road that rises 75 feet over a horizontal distance of 2000 feet.**

$$\frac{75}{2000} = \frac{3}{80}$$

Ex. 3 **Graph** $\frac{1}{2}x + \frac{2}{3}y = 6$.

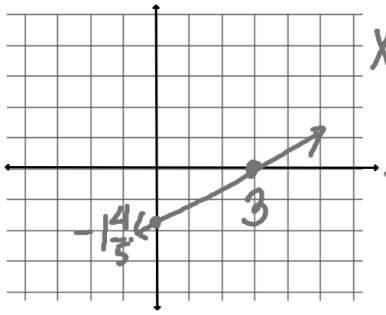


$\frac{3}{2}\left[\frac{2}{3}y = \frac{-1}{2}x + 6\right]$

$y = \frac{-3}{4}x + 9$

$y = mx + b$

Ex. 4 **Graph** $3x - 5y = 9$ **using intercepts.**



x-int $(3, 0)$

y-int $(0, \frac{-9}{5})$

$-1\frac{4}{5}$

Ex. 5 Graph $x = -4$ and $y = \frac{1}{2}$.