

# Perpendicular and Parallel Lines

10/24

## • Parallel Lines

- Never cross  $\rightarrow$  Graphically
- = Same slope, different y-intercepts

## • Perpendicular Lines

- Cross at  $90^\circ$  angle
- Opposite Reciprocal slopes  
 $(+, -)$   $(\frac{a}{b}, \frac{b}{a})$   
or  
 $(a, \frac{1}{a})$

Find a line parallel to  $y = \frac{1}{2}x + 5$  and goes through  $(2, 4)$ .

$x_1 \ y_1$

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

$$y - 4 = \frac{1}{2}(x - 2)$$

$$\begin{array}{ccc} y - 4 & = & \frac{1}{2}x - 1 \\ +4 & & +4 \end{array}$$

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

Find a line <sup>perpendicular</sup> ~~parallel~~ to  $y = \frac{1}{2}x + 5$  and goes through  $(2, 4)$ .

$x_1, y_1$

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

$$y - 4 = -2(x - 2)$$

$$\begin{array}{l} y - 4 = -2x + 4 \\ +4 \qquad +4 \end{array}$$

$$y = -2x + 8$$