January 23rd

Parallel + Perpendicular Lines

(||) (⊥)

Parallel Lines

1. They have the EXACT same rate of change (slope) so they NEVER intersect.

2. They have to have DIFFERENT y-intercepts.

* convert equations into slope-intercept form to know if they are parallel *

Perpendicular Lines

1. ALWAYS create 4-90° angles
2. the y-intercept does not matter
* 3. the rate of change (slope) of the 2 lines have to be inverse reciprocals.

example: $\boxed{\frac{3}{4}} \rightarrow -\frac{3}{4} \rightarrow \boxed{\frac{-4}{3}}$ slopes of ⊥ lines

$(-5) \rightarrow 5 \rightarrow (\frac{1}{5})$

Starter

Algebraically find a line that is parallel to $y = -\frac{1}{4}x + 2$ + goes through $(-8, -3)$

- your answer needs to be in slope-intercept form

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

$$y + 3 = -\frac{1}{4}(x + 8)$$

$$y + 3 = -\frac{1}{4}x - 2$$

$$-3 \qquad -3$$

$$y = -\frac{1}{4}x - 5$$

Write an equation of a line that is $\parallel$ to $y = \frac{1}{2}x + 8$

$y = \frac{1}{2}x + 4$ $y = \frac{1}{2}x + 27$

$y = \frac{1}{2}x + 10{,}000$ $y = \frac{1}{2}x + 2.39$

Write an equation of a line that is $\perp$ to $-3x + y = 9$ & goes through $(2, -6)$

$-3x + y = 9$

$+3x \quad +3x$

$y = 3x + 9$

inverse reciprocal

$3 \rightarrow -3 \rightarrow \boxed{-\frac{1}{3}}$

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

$y + 6 = -\frac{1}{3}(x - 2)$

$y + 6 = -\frac{1}{3}x + \frac{2}{3}$

$-6 \quad -6$

$y = -\frac{1}{3}x - 5\frac{1}{3}$