

Parallel & Perpendicular Lines

The following lines are parallel:

$$y = \underline{3}x - 5$$

$$y = \underline{3}x + 2$$

same slope means parallel $\parallel //$

The following lines are perpendicular:

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

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

the slope numbers flip and have different signs \perp

Determine whether the two lines are parallel, perpendicular, or neither.

* always have equations in slope-intercept form

1) $y = \underline{2}x + 2$
 $y = \underline{2}x - 4$

parallel

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

perpendicular

3) $y = \underline{2}x - 3$
 $y = \underline{-2}x - 4$

neither

Write a line parallel & perpendicular to the following information given

$$y = \frac{3}{4}x - 4 \text{ and goes through the point } (0, -2)$$

For parallel:

$$m = \frac{3}{4} \quad \begin{matrix} x_1, y_1 \\ (0, -2) \end{matrix}$$

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

$$y - (-2) = \frac{3}{4}(x - 0)$$

$$y + 2 = \frac{3}{4}x + 0$$

$$\begin{matrix} -2 & -2 \end{matrix}$$

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

For perpendicular:

$$m = \frac{-4}{3} \quad \begin{matrix} x_1, y_1 \\ (0, -2) \end{matrix}$$

$$y - (-2) = \frac{-4}{3}(x - 0)$$

$$y + 2 = \frac{-4}{3}x + 0$$

$$\begin{matrix} -2 & -2 \end{matrix}$$

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