

→ Please work on your BW paper!

Today's Essential Question:

how do I write equations of parallel & perpendicular lines? How do I solve a system of equations?

Review -
Find slope $(-4, 9)$ & $(5, -6)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow \frac{-6 - 9}{5 - (-4)} = \frac{-15}{9} = \boxed{\frac{-5}{3}}$$

Parallel \rightarrow same slope $= -\frac{5}{3}$

Perpendicular \rightarrow opposite reciprocals $\rightarrow \frac{3}{5}$
 \downarrow flip + change sign

Write the equation in slope-intercept form: through $(-1, 2)$ and is parallel to $y = 3x + 1$.

1st \rightarrow slope of line $m = 3$

2nd \rightarrow parallel? $m = 3$

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

$$y - 2 = 3(x + 1)$$

$$y - 2 = 3x + 3$$

$$\begin{array}{r} +2 \\ +2 \end{array}$$
$$y = 3x + 5$$

Ex. Write equation of line
perpendicular to $y = -\frac{1}{2}x + 1$
and passes through $(3, -4)$.

$$m_{\perp} = 2$$

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

$$y + 4 = 2(x - 3)$$

$$y + 4 = 2x - 6$$

$$\begin{array}{r} -4 \\ -4 \end{array}$$

$$y = 2x - 10$$

① parallel
through $(-6, 2)$

$$m = -\frac{1}{3}$$

$$m_{||} = -\frac{1}{3}$$

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

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

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

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

+2

+2

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

② perp to $y = 2x - 1$
through $(4, -8)$

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

$$m_{\perp} = -\frac{1}{2}$$

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

$$y + 8 = -\frac{1}{2}(x - 4)$$

$$y + 8 = -\frac{1}{2}x + 2$$

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

HW - Worksheet

1-12 - another
piece of
paper