PARALLEL AND PERPENDICULAR LINES

PARALLEL LINES HAVE THE _SAME SLOPES!_

PERPENDICULAR LINES HAVE _OPPOSITE RECIPROCAL SLOPES_ Their **PRODUCT** is _-1_.

USE THE GIVEN INFO TO WRITE A LINEAR EQUATION IN THE INDICATED FORM:

1) Passes through (4, -1) and parallel to $y = -3x + 1$

use $m = -3$

$$y + 1 = -3(x - 4)$$

2) Passes through (0, -1) and parallel to $3x - 6y = 12$

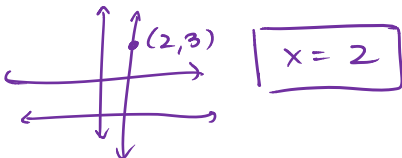find m: $-6y = -3x + 12$

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

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

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

3) Passes through (1, 8) and perpendicular to $y = \frac{3}{5}x - 1$

$$y - 8 = -\frac{5}{3}(x - 1)$$

$m = -\frac{5}{3}$

4) Passes through the point (2, 3) and perpendicular to $y = -4$

(2,3)

$$x = 2$$

5) Passes through (2, 5) and perpendicular to the line through the points (–2, –1) and (–3, 6)

You have a point, find slope!

$\frac{-1 - 6}{-2 - -3} = \frac{-7}{1}$ → take opp. recip. : $\frac{1}{7}$

$$y - 5 = \frac{1}{7}(x - 2)$$

6) Write an equation of a line passing through (−5, −1) and perpendicular to $y = 2x − 8$

$$m = -\frac{1}{2} \qquad pt: (-5,-1)$$

$$\boxed{y + 1 = -\frac{1}{2}(x + 5)}$$

7) Write an equation of a line passing through (4, −6) and perpendicular to $4x − 5y = 12$

Find slope: $4x - 5y = 12$

$$-5y = -4x + 12$$

$$y = \frac{4}{5}x - \frac{12}{5}$$

$$m = \frac{-5}{4} \qquad (4, -6)$$

$$\longrightarrow \boxed{y + 6 = \frac{-5}{4}(x - 4)}$$

8) Passes through the point (−2, 5) and perpendicular to the line through (−5, 7) and (3, 3)

Find slope:
$$\frac{7 - 3}{-5 - 3} = \frac{4}{-8} = \frac{-1}{2}$$

$$\boxed{y - 5 = 2(x + 2)}$$