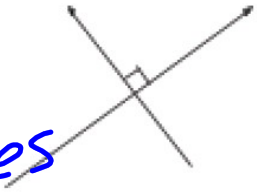

PERPENDICULAR LINES HAVE THE:

Opposite Reciprocal Slopes
(Flip)

Perpendicular Lines are: Two non-vertical lines are perpendicular if and only if the product of their slopes is -1. These are called opposite reciprocals.

SLOPE INTERCEPT FORM: $y = mx + b$

You must have a Slope **and a** Y-int.

POINT SLOPE FORM: $y - y_1 = m(x - x_1)$

You must have a Point **and a** Slope.

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EXAMPLES:
State the slope of the perpendicular line in each of the following equations.

A) $y = 2x - 6$

$L_1 \perp L_2$

$2 \quad -\frac{1}{2}$

B) $2x - 8y = 16$

$-2x \quad -2x$

$\frac{-8y}{-8} = \frac{-2x}{-8} + \frac{16}{-8}$

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

$L_1 \quad \perp \quad L_2$

$\frac{1}{4} \quad -4$

C) Line that goes through pts:
(2 , 1) & (8 , 5)

$\frac{y_2 - y_1}{x_2 - x_1} = \frac{5-1}{8-2} = \frac{4}{6}$

$L_1 \perp L_2$

$\frac{2}{3} \quad -\frac{3}{2}$

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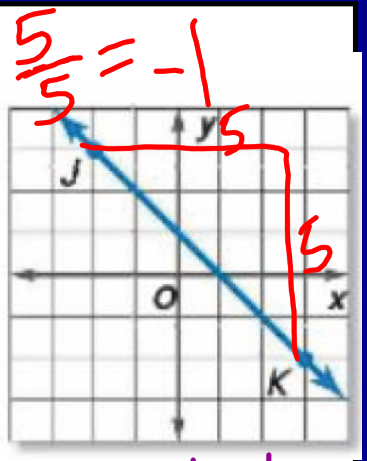
Example #1 Find the equation of a line perpendicular to the given line but that also passes through point (-2, 1).



$\frac{5}{5} = -1$

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

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

$y = x + 3$

$m_1 \perp m_2$

$-1 \cdot 1 = -1$

Example #2 Find the equation of the line perpendicular to $y = 1/3x - 1$ and passes through the point (1,3)

Graph the perpendicular line.

$L_1 \perp L_2$

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

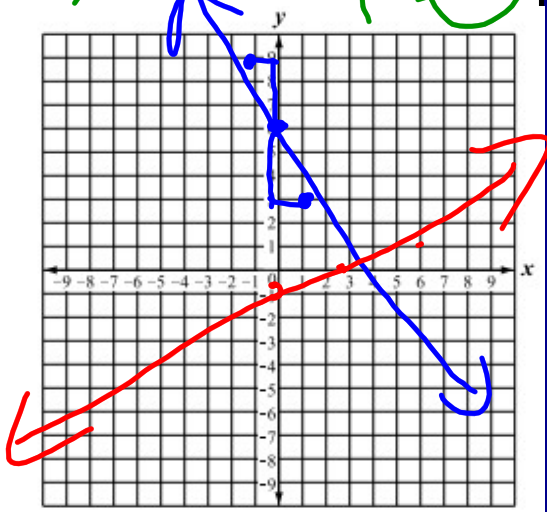
$y - y_1 = m(x - x_1)$

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

$y - 3 = -3x + 3$

$+3 \quad +3$

$y = -3x + 6$ L_2



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Example #3 *Find the equation of the line perpendicular to* $6x - 3y = 12$ *and passes through the point* $(0, 6)$.

$-6x \quad -6x$

$\frac{-3y}{-3} = \frac{-6x}{-3} + \frac{12}{-3}$

$y = 2x - 4$

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

$y - 6 = -\frac{1}{2}(x - 0)$

$y - 6 = -\frac{1}{2}x - 0$

$+6 \qquad +6$

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

$L_1 \perp L_2$

$2 \quad -\frac{1}{2}$

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