

Name Key
Mrs. Roubos

Date _____
8R Period _____

Parallel vs Perpendicular Lines DO NOW

Parallel Lines: (same slope!) $\rightarrow m$



Parallel lines have the same slopes!

★ They must have different y-intercepts



Remember that parallel lines never intersect.

$$\begin{aligned} y &= 3x + 5 \\ y &= 3x - 7 \\ y &= 3x + 0.5 \\ y &= 3x \end{aligned}$$

These lines are ALL parallel. They all have the same slope (m). (Remember $y = mx + b$.)

Examples:

1) What is the slope of a line that is parallel to: $y = 5x + 3$

$$m = 5$$

parallel = 5

$$\begin{aligned} &\leftarrow m = 5 \\ &\leftarrow m = 5 \end{aligned}$$

★ Same slope

2) Which equation is parallel to $y = 3x + 4$?

$$m = 3$$

parallel = 3

★ Same slope

a) $y = -3x + 6$

b) $y = 4x + 3$

c) $y = 3x + 5$

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

$$\begin{aligned} &\leftarrow m = 3 \\ &\leftarrow m = 1 \end{aligned}$$

3) Which equation is NOT parallel to $y = 2x + 6$

a) $y = 2x + 3$

b) $2y = 4x + 8$

c) $y = 2x + 7$

d) $y = -2x + 6$

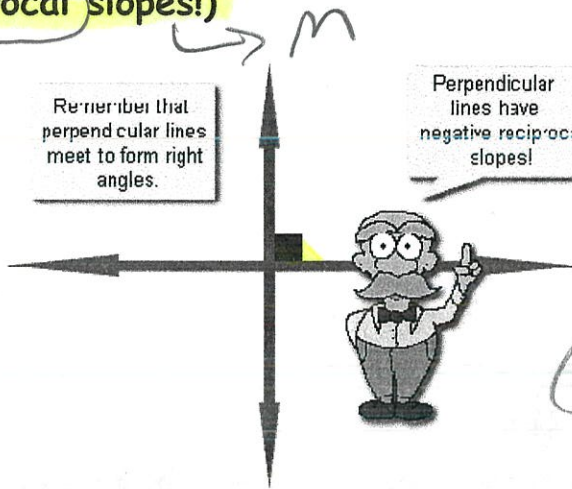
NOT the same slope

Perpendicular Lines: \rightarrow flip the fraction
 (negative reciprocal slopes!)

Change the sign

Remember that perpendicular lines meet to form right angles.

Perpendicular lines have negative reciprocal slopes!



The y-intercepts may be the same or can be different

Perpendicular lines have negative reciprocal slopes.

To find a negative reciprocal of a number, flip the number over (invert) and negate that value.	
$\frac{1}{2} \rightarrow -\frac{2}{1} = -2$	$-\frac{4}{5} \rightarrow \frac{5}{4}$
$3 = \frac{3}{1} \rightarrow -\frac{1}{3}$	$-5 \rightarrow \frac{1}{5}$

$$y = 4x + 7$$

$$y = -\frac{1}{4}x - 6$$

These lines are perpendicular. Their slopes (m) are negative reciprocals. (Remember $y = mx + b$.)

Examples:

1) What is the slope of a line that is perpendicular to $y = 6x + 7$

$m = 6$ $\frac{6}{1} \rightarrow -\frac{1}{6}$ perp: $-\frac{1}{6}$

2) What is the slope of a line that is perpendicular to $y = \frac{2}{3}x - 3$

$m = \frac{2}{3}$ $-\frac{2}{3} \rightarrow \frac{3}{2}$ perp. $\frac{3}{2}$