

Parallel lines never intersect.

Parallel lines have the SAME slope!

different y-intercept

Example: $y = \frac{1}{2}x + 1$ and $y = \frac{1}{2}x - 2$

Perpendicular lines intersect to form a right angle.

The slopes of perpendicular lines are opposite reciprocals

Flip the fraction and change sign

Example: $y = \frac{1}{2}x - 1$ and $y = -2x + 1$

Since $\frac{1}{2}(-2) = -1$ the lines are perpendicular

Two numbers whose product is -1 are opposite reciprocals

If lines intersect but do not form a right angle, they are neither parallel nor perpendicular.

Slopes are not equal or opposite reciprocals.

Divide you paper into
4 squares

Cut another piece of paper
into 4 squares

Square 1

Classifying Lines

Are the graphs of $4y = -5x + 12$ and $y = \frac{4}{5}x - 8$ parallel, perpendicular, or neither?

Step 1: Find slope. Write equation in slope-intercept form

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

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

$$y = -\frac{5}{4}x + 3$$

Step 2: Compare slope

The slope of the graph of $y = -\frac{5}{4}x + 3$ is $-\frac{5}{4}$.

The slope of the graph of $y = \frac{4}{5}x - 8$ is $\frac{4}{5}$.

The slopes are not the same, so the lines cannot be parallel.

Multiply the slopes. They equal -1 so they are opposite reciprocals

\therefore perpendicular

practice problems

a. $y = \frac{3}{4}x + 7$ and $4x - 3y = 9$

b. $6y = -x + 6$ and $y = -\frac{1}{6}x + 6$

Put on back of foldable square.