Algebra 1 4.4

Same slope

Write the equation of a line parallel to a given line

Write the equation of a line perpendicular to a given line

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

What do we need to write an equation for a line?

slope

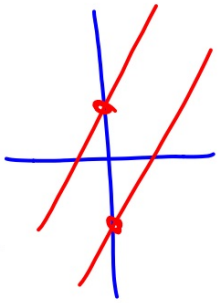
vertical ↕ $x =$

horizontal ↔ $y =$

parallel Same slope $m = \frac{\text{rise}}{\text{run}}$

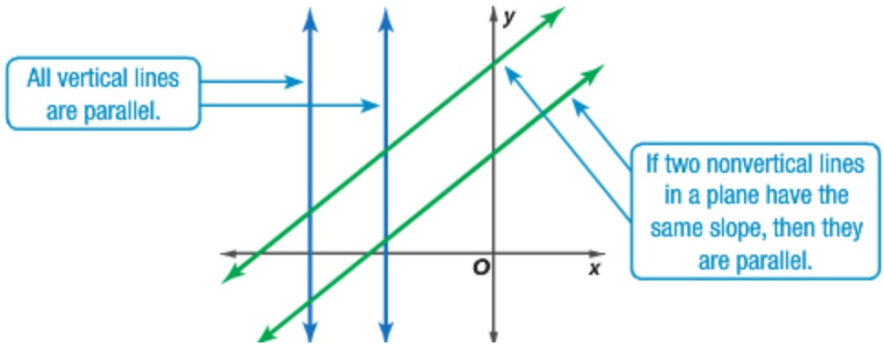
perpendicular

spaghetti lines

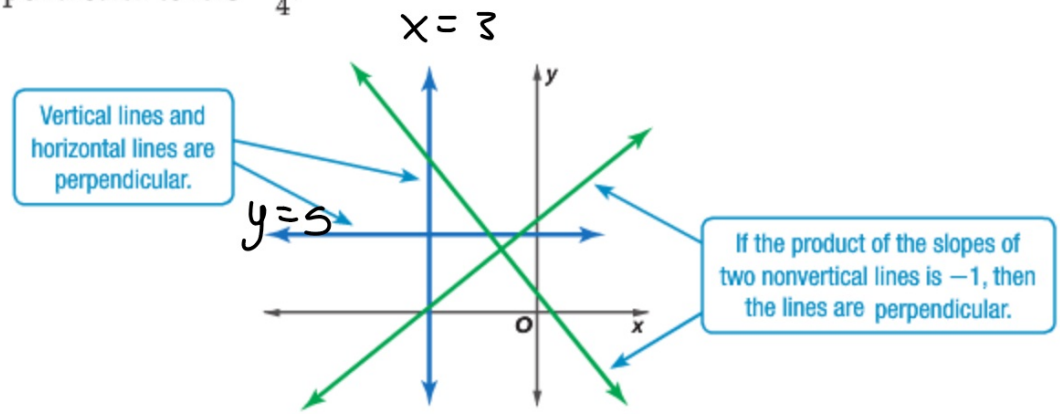


Quiz 4.3-4.4

1 Parallel Lines Lines in the same plane that do not intersect are called **parallel lines**. Nonvertical parallel lines have the same slope.



2 Perpendicular Lines Lines that intersect at right angles are called **perpendicular lines**. The slopes of nonvertical perpendicular lines are opposite reciprocals. That is, if the slope of a line is 4, the slope of the line perpendicular to it is $-\frac{1}{4}$.



Eyeball is not enough...

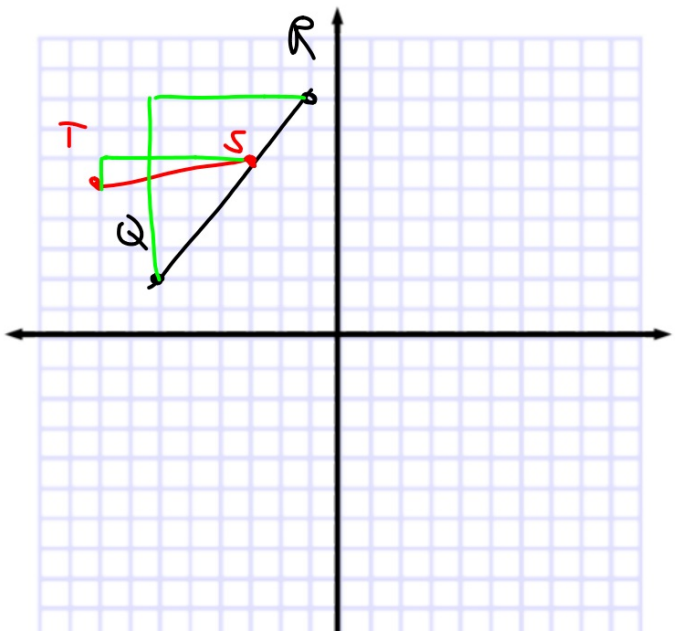
GuidedPractice

2. CONSTRUCTION On the plans for a treehouse, a beam represented by $\overline{QR}$ has endpoints $Q(-6, 2)$ and $R(-1, 8)$. A connecting beam represented by $\overline{ST}$ has endpoints $S(-3, 6)$ and $T(-8, 5)$. Are the beams perpendicular? Explain.

6/5

-1/5

no

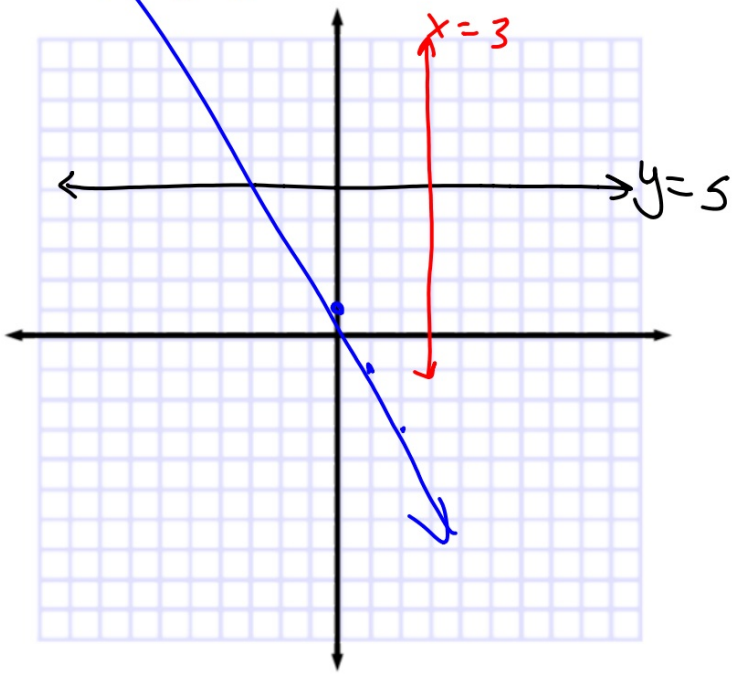


Example 3 Parallel or Perpendicular Lines

Determine whether the graphs of $y = 5$, $x = 3$, and $y = -2x + 1$ are *parallel* or *perpendicular*. Explain.

What do we need to know so that we can answer the question?

* $x = 3$ + $y = 5$ are perp.



3. Determine whether the graphs of $6x - 2y = -2$, $y = 3x - 4$, and $y = 4$ are *parallel* or *perpendicular*. Explain.

a b c

$y = mx + B$

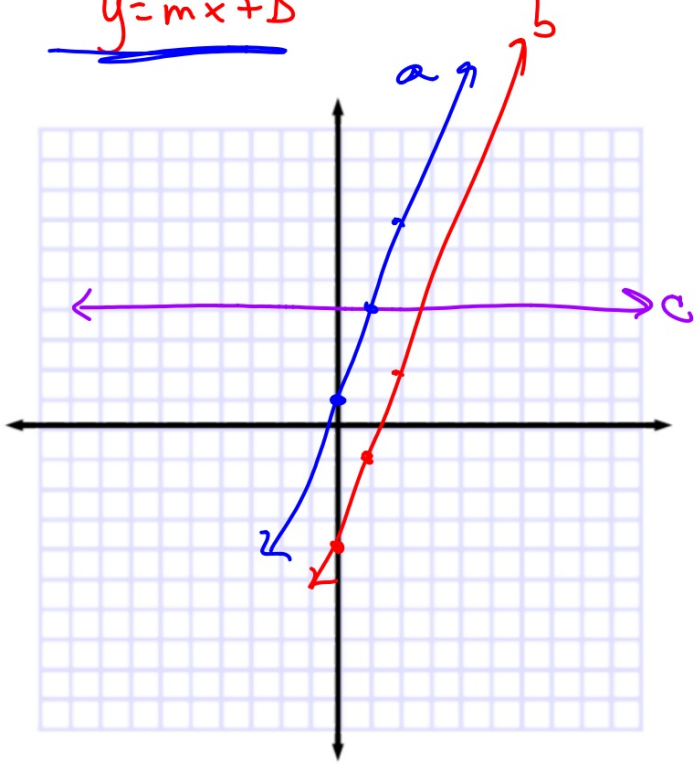
What do we need to know?

$6x - 2y = -2$

$-6x \quad -6x$

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

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



PT-slope $y-y=m(x-x)$

Write an equation in ~~slope-intercept~~ form ~~for~~ the line that passes through the given point and is perpendicular to the graph of the equation.

7. $(-2, 3), y = -\frac{1}{2}x - 4$

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

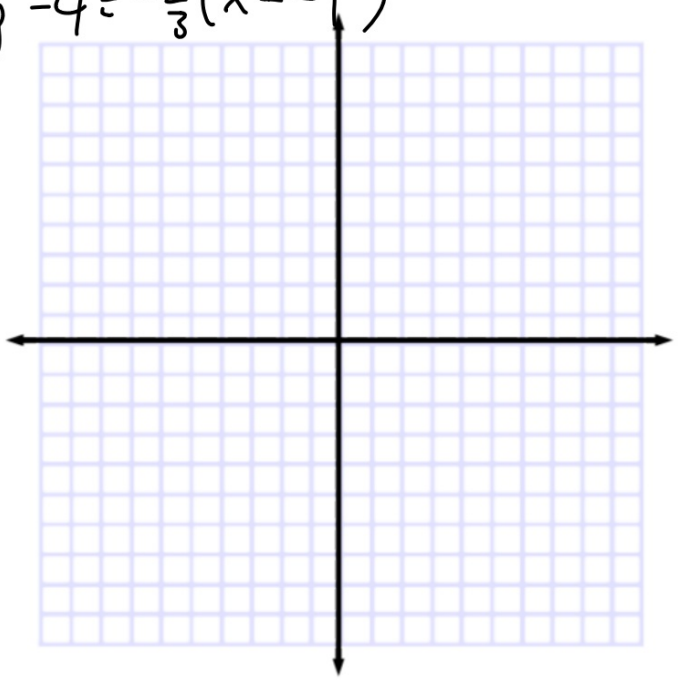
8. $(-1, 4), y = 3x + 5$ $\frac{1}{3}$

$m = 3$ $m = -3$

What do we need to know?

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

$y-4=-\frac{1}{3}(x--1)$



$\parallel$ $\perp$

parallel perp.

Same opp & recip

$y - ? = m(x - ?)$