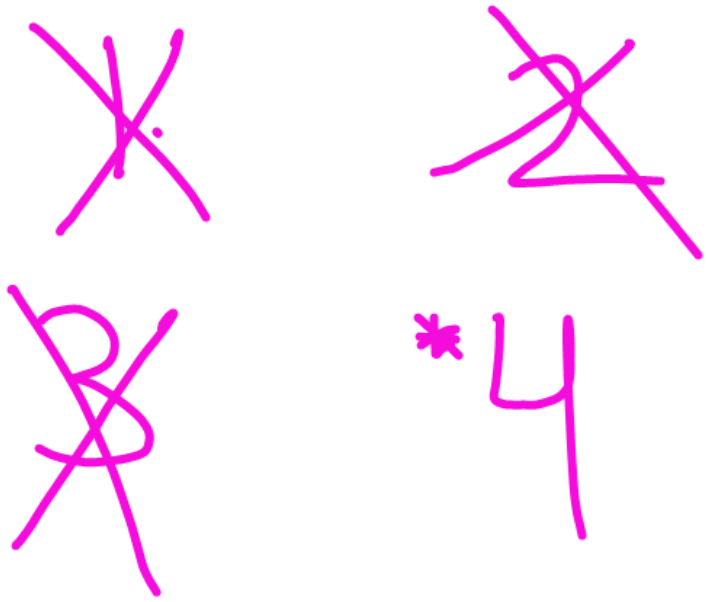


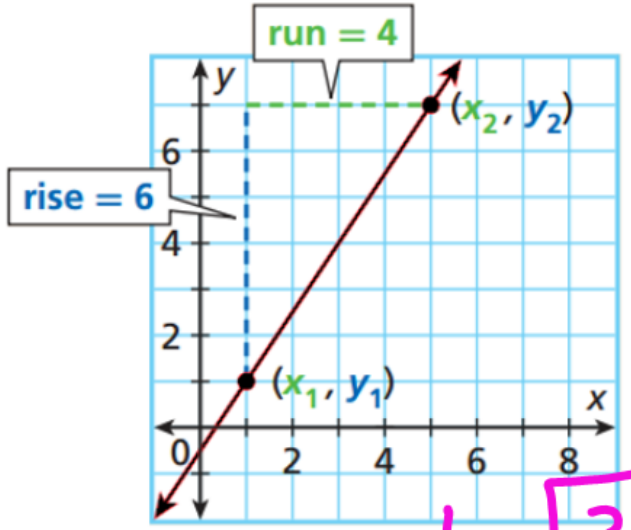
1. 25%
2. 50%
3. 75%

The Monty Hall Problem

Unit 2 Day 3 Lesson Slope of lines

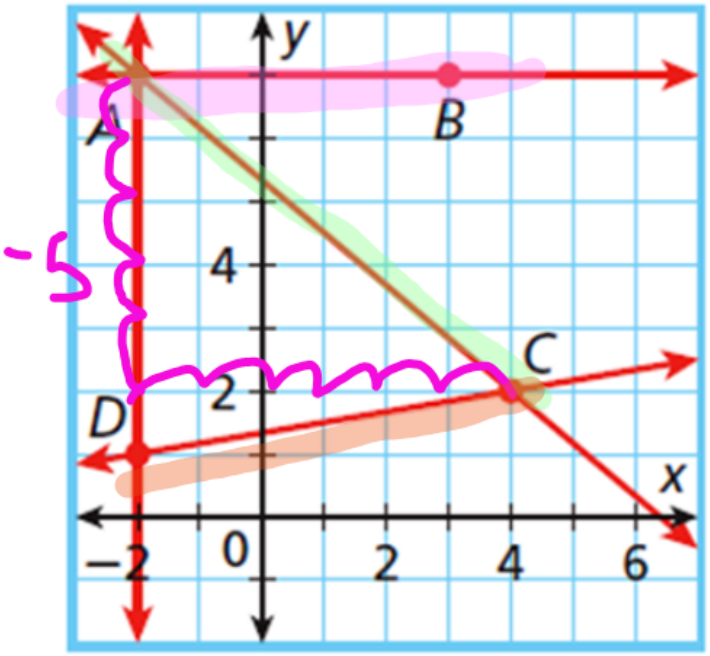
TSW Find the slope of a line and use it to identify parallel and perpendicular lines.

Slope of a Line

DEFINITION	EXAMPLE
The rise is the difference in the y-values of 2 points on a line.	
The run is the difference in the x-values of 2 points on a line.	
The slope of a line is the ratio of rise to run. If (x_1, y_1) and (x_2, y_2) are any 2 points on a line, the slope of the line is $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{rise}}{\text{run}}$	

slope = $\frac{6}{4} = \frac{3}{2}$

EXAMPLE 1 Use the slope formula to determine the slope of each line.

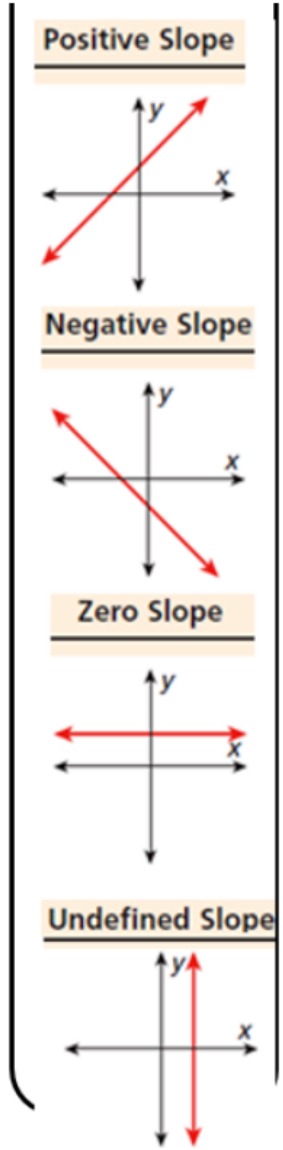


A. $\overleftrightarrow{AB}$ $m = \frac{\text{rise}}{\text{run}} = \frac{0}{5} = 0$

B. $\overleftrightarrow{AC}$ $m = \frac{-5}{6}$

C. $\overleftrightarrow{CD}$ $m = \frac{1}{6}$

D. $\overleftrightarrow{AD}$ $m = \frac{-6}{0} =$ undefined



Find the slope of the line through the given points.

1) H (3, 5) and S (-4, 2) $x_1\ y_1\ x_2\ y_2$

$m = \frac{2-5}{-4-3} = \frac{-3}{-7} = \frac{3}{7}$

2) S (-6, 1) and D (3, -6) $x_1\ y_1\ x_2\ y_2$

$m = \frac{-6-1}{3--6} = \frac{-7}{9}$

Slopes of Parallel and Perpendicular Lines

Parallel Line Theorem- Lines are parallel if their slopes are the same.

Perpendicular Lines Theorem- Lines are perpendicular if their slopes are opposite reciprocals

$\frac{3}{4}$ $\frac{-4}{3}$

EXAMPLE 2 **Use slopes to determine whether the lines are parallel, perpendicular, or neither.**

A) $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ for A (2,1), B (1,5), C (4,2), and D (5, -2)

x_1, y_1 x_2, y_2

$\overleftrightarrow{AB}$ $m = \frac{5-1}{1-2} = \frac{4}{-1} = -4$

$\overleftrightarrow{CD}$ $m = \frac{-2-2}{5-4} = \frac{-4}{1} = -4$

parallel

B) $\overleftrightarrow{ST}$ and $\overleftrightarrow{UV}$ for S (-2,2), T (5, -1), U (3,4), and V (-1, -4)

$\overleftrightarrow{ST}$ $m = \frac{-1-2}{5-(-2)} = \frac{-3}{7}$

$\overleftrightarrow{UV}$ $m = \frac{-4-4}{-1-3} = \frac{-8}{-4} = 2$

neither

C) $\overleftrightarrow{FG}$ and $\overleftrightarrow{HJ}$ for F (1,1), G (2,2), H (2,1), and J (1,2)

$\overleftrightarrow{FG}$ $m = \frac{2-1}{2-1} = \frac{1}{1} = 1$

$\overleftrightarrow{HJ}$ $m = \frac{2-1}{1-2} = \frac{1}{-1} = -1$

perpendicular

$m = \frac{0}{8} = 0$ ⊥

$m = \frac{5}{0} =$ undefined

perpen.

Assignment Unit 2 Day 3 Slope

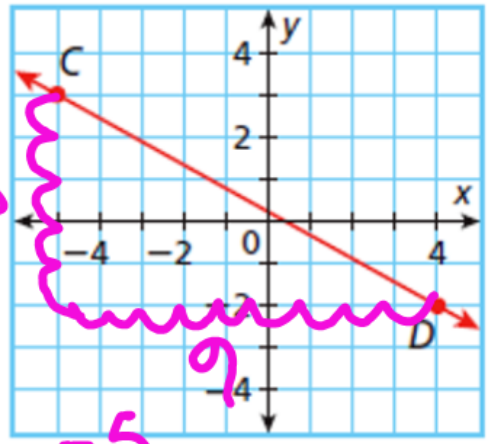
$m = \frac{rise}{run}$

Guided Practice

Determine the slope of each line.

L → R

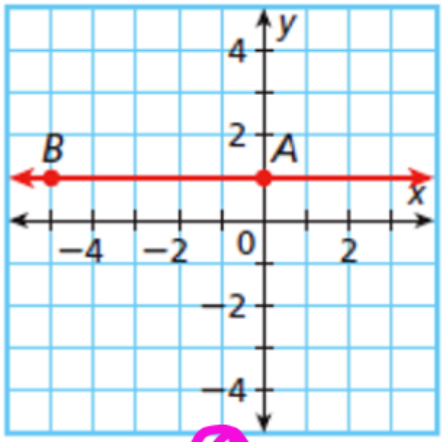
1) $\overleftrightarrow{CD}$



-5, 9

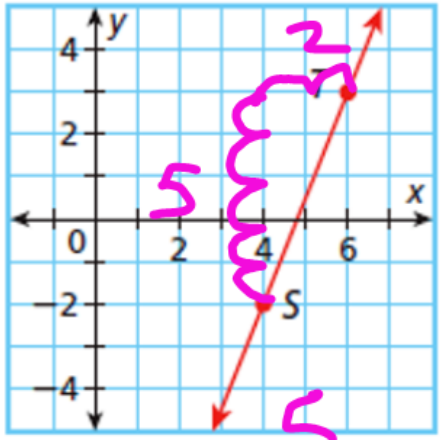
$m = -\frac{5}{9}$

2) $\overleftrightarrow{AB}$



$m = 0$

3) $\overleftrightarrow{ST}$



5, 2

$m = \frac{5}{2}$

Use slopes to determine whether the lines are parallel, perpendicular, or neither.

4) $\overleftrightarrow{HJ}$ and $\overleftrightarrow{KM}$ for H (3,2), J (4,1), K (-2, -4), and M (-1, -5)

$\overleftrightarrow{HJ}$ $m = \frac{1-2}{4-3} = \frac{-1}{1} = -1$

$\overleftrightarrow{KM}$ $m = \frac{-5--4}{-1--2} = \frac{-1}{1} = -1$

parallel