

## Geometry BELL WORK

Determine the slope of the line that contains the given points.

1)  $R(2, -6), S(-6, 5)$   
 $x_1, y_1, x_2, y_2$

$$\frac{5 - (-6)}{-6 - 2} = \frac{11}{-8}$$

$$-\frac{11}{8} = -\frac{11}{8}$$

2)  $P(-3, -5), Q(-3, -1)$   
 $x_1, y_1, x_2, y_2$

$$\frac{-1 - (-5)}{-3 - (-3)} = \frac{4}{0}$$

undefined

## 3-3 Slopes of Lines

We used angle relationships in parallel lines to determine congruent angles.

Today we will:

- \* Find slopes of lines.
- \* Use slope to identify parallel and perpendicular lines

**(G.CO.C.9 Congruence: Prove theorems about lines and angles)**

## Parallel and Perpendicular Lines

You can use the slopes of two lines to determine whether the lines are parallel or perpendicular.

Lines with the same slope are parallel.

The slopes of perpendicular lines are....

negative reciprocals

Determine whether  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  are *parallel*, *perpendicular*, or *neither* for  $A(1, 1)$ ,  $B(-1, -5)$ ,  $C(3, 2)$ , and  $D(6, 1)$ . Graph each line to verify your answer.

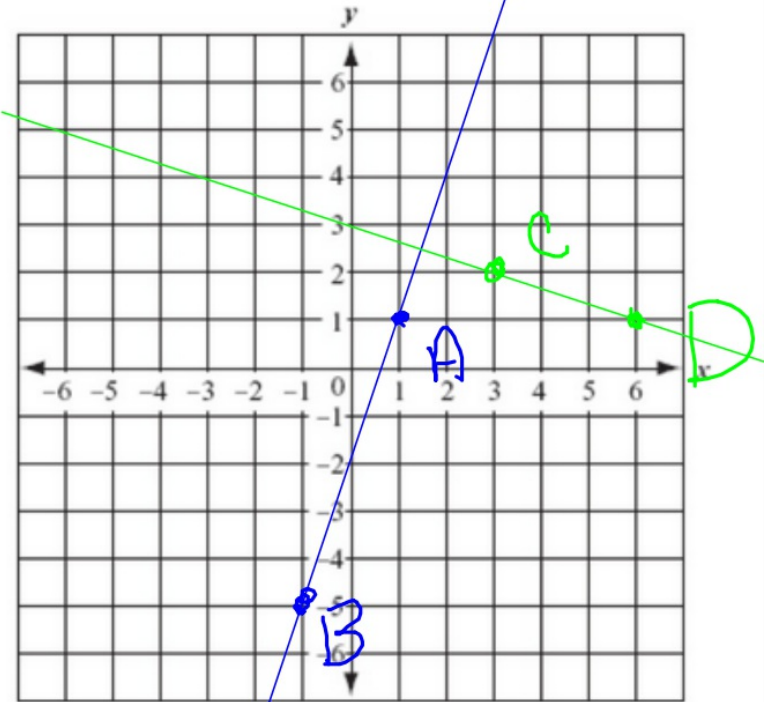
$x_2, y_2$   $x_1, y_1$   $x_2, y_2$

$x_1, y_1$

$$m \text{ of } \overleftrightarrow{AB} = \frac{-5 - 1}{-1 - 1} = \frac{-6}{-2} = \frac{3}{1}$$

$$m \text{ of } \overleftrightarrow{CD} = \frac{1 - 2}{6 - 3} = \frac{-1}{3}$$

$\frac{3}{1} \perp \frac{-1}{3}$



In summary:

Parallel lines have the same  
slope.

Perpendicular lines have a negative  
reciprocal slope.

slope

3

$\frac{2}{5}$

-4

|| slope

$\frac{3}{1}$

$\frac{2}{5}$

$-\frac{4}{1}$

L slope

$-\frac{1}{3}$

$-\frac{5}{2}$

$\frac{1}{4}$

Some postulates:

### **Slopes of Parallel Lines**

Two lines have the same slope if they are parallel.

Two lines are parallel if they have the same slope.

All vertical lines are parallel.

### **Slopes of Perpendicular Lines**

Two lines have negative reciprocal slopes if they are perpendicular.

The product of perpendicular slopes is -1.

Vertical and horizontal lines are perpendicular.

$$\frac{3}{5} \times \frac{-5}{3} = \frac{-15}{15} \\ = -1.$$

Determine whether  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  are *parallel*, *perpendicular*, or *neither*.

$$A(14, 13), B(-11, 0), C(-3, 7), D(-4, -5)$$

$$\overleftrightarrow{AB} = \frac{-13}{-25} = \frac{13}{25}$$

$$\overleftrightarrow{CD} = \frac{-12}{-1} = \frac{12}{1}$$

*Neither*



Determine whether  $\overleftrightarrow{AB}$  and  $\overleftrightarrow{CD}$  are *parallel*, *perpendicular*, or *neither*.

$$A(3, 6), B(-9, 2), C(5, 4), D(2, 3)$$

$$m \text{ of } \overleftrightarrow{AB} = \frac{2-6}{-9-3} = \frac{-4}{-12} = \frac{1}{3}$$

$$m \text{ of } \overleftrightarrow{CD} = \frac{3-4}{2-5} = \frac{-1}{-3} = \frac{1}{3}$$

Parallel

QUIZ tomorrow over 3.1 - 3.3

Assignment:

3.3b pg 190 # 1-8