

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Learning Goal 6.1**

Calculating the slope of the line and

- Using the slope to graph a line, and
- Applying the slope to parallel and perpendicular lines.

**Warmup** State the reciprocal of each of the following:

- a.  $\frac{4}{5} \neq \frac{5}{4}$       b.  $3 \neq \frac{1}{3}$       c.  $-\frac{5}{3} \neq -\frac{3}{5}$       d.  $-\frac{1}{16} \neq -16$

**Define**

Parallel Lines	<p>- never touch - always the same distance apart } same slope A    B</p>
Perpendicular Lines	<p>- cross at 90° angles / right angles } slopes are negative reciprocals of each other - orthogonal A ⊥ B</p>

**Investigation** On a separate sheet of graph paper:

$$m_1 = \frac{3}{4} \quad m_2 = -\frac{4}{3}$$

- a. Through the point (3,5) draw a line with a slope of:

$$\frac{3}{2}$$

- b. Through the point (3,5) draw a line with a slope of:

$$-\frac{2}{3}$$

- c. Through the point (-1, 3) draw a line with the slope of:

$$\frac{3}{2}$$

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

$$\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

What do you notice about the relationship between the lines you drew?

a and c are parallel to each other and perpendicular to b

**Example** Complete the following table:

Slope	Slope of a Perpendicular Line	Slope of Parallel Line
$\frac{4}{5}$	$-\frac{5}{4}$	$\frac{4}{5}$
$-\frac{3}{7}$	$\frac{7}{3}$	$-\frac{3}{7}$
$-6$	$\frac{1}{6}$	$-6$
0 (zero)	DNE	0
undefined	0	NS/undefined/DNE

**Example** On the graph paper provided

- Draw a line through  $(-5, -7)$  with a slope of  $-\frac{5}{3}$ .
- Draw a line through  $(-5, -7)$  that is perpendicular to the line drawn in part a.
- Draw a line through  $(3, 4)$  that is parallel to the line drawn in part a.

To assist with your assignment!

$(x, y)$   
 $(3, 5)$   
a. slope  $\frac{3}{2}$  rise  $\frac{-3}{-2}$

b.  $\frac{-2}{3} = \frac{2}{-3}$

c.  $(-1, 3)$

$\frac{3}{2} = \frac{-3}{-2}$



