Math 1 Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**5-2 Parallel and Perpendicular Lines** Date\_\_\_\_\_\_\_\_

* I can find the equation of a line parallel to another line through a given coordinate.
* I can find the equation of a line perpendicular to another line through a given coordinate.

1. *On the below coordinate plane, graph the following:*

 line (1): a line that passes through the points (4, 4) and (8, 5)

 line (2): a line that passes through the points (0, -2) and (8, 0)

 (be sure to extend the lines in both directions – so they are *lines*, not *line segments*)



2. How does it look like these lines are related?

3. Use the given points in number (1) to find the slope of line 1 and the slope of line 2. Write them

 below. What do you notice?

 Slope of line 1 Slope of line 2

4. Fill in the blanks of the below statement:

 If two lines are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, then their slopes will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. *On the below coordinate plane, graph the following:*

 line (3): a line that passes through the points (-1, -4) and (2, 8)

 line (4): a line that passes through the points (0, 0) and (4, -1)

 (be sure to extend the lines in both directions – past the point of intersection in both directions)



6. How does it look like these lines are related?

7. Use the given points in number (5) to find the slope of line 3 and line 4. What do you notice?

 Slope of line 1 Slope of line 2

8. Multiply (slope of line 3)(slope of line 4).

9. The following two functions are perpendicular (graph them on your calculator to check). Multiply

 their slopes. What do you get (again)?

  

10. Fill in the blanks of the below statement:

If two lines are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, then the product of their slopes will be \_\_\_\_\_\_.

This means that their slopes are ***opposite reciprocals***.

**Point-slope form:** 

***Example:*** Find the equation of the line in both point – slope and slope – intercept form that passes through the point (4, 8) and is perpendicular to the line 

11. Find the equation of a line in both point – slope and slope – intercept form that passes through the point (6, 10) and is parallel to the line that passes through the points (2, 6) and (8, 12).

**Practice:**

1. Find the slope of all lines parallel to 

2. Find the slope of all lines perpendicular to 

3. Find the equation of the line that is parallel to and passes through the point (4, 8).

4. Find the equation of the line that is parallel to  and passes through the point (5, 8).

5. Find the equation of the line that is perpendicular to  and passes through the point (6, -3).

6. Find the equation of the line that is perpendicular to  and passes through the point (-4, 5).

7. The slope of a line is 4, and the line passes through the points (5, 8) and (***a***, 6). Find *a.*

8. If the slope of a line is  and the line passes through the points (***a***, 3) and (6, ***b***). Find *a* and *b*.