**Parallel & Perpendicular Lines**

1. Jason and Scott plan on biking to the center of town to get ice cream at the convenience store. Since Scott had to put air in his tires, Jason was able to get 1 mile ahead of Scott before Scott left the house. Both bikers rode at a speed of 15 miles per hour.
2. Write an equation in form that represents Jason’s trip.
3. Write an equation in form that represents Scott’s trip.
4. Will Jason and Scott meet *before* they both reach the store? Explain.
5. If you were to graph both lines on the same coordinate plane, predict what your graph would look like.
6. a. On the same set of axes graph the following lines. Use a ruler to make your lines.



*y* = 3*x* + 4

*y* = 3*x* − 4

*y* = 3*x*

1. What do you notice about the lines you graphed in problem 2?
2. What can you say about the slopes of parallel lines?
3. a. On the same set of axes graph the following lines. Use a ruler to make your lines.







1. How does the line compare to ? Discuss the slopes of each line and what type of angle is formed where the lines intersect.
2. a. On the same set of axes graph the following lines. Use a ruler to make your lines.







1. How does the line compare to ? Discuss the slopes of each line and what type of angle is formed where the lines intersect.

**Perpendicular lines** have slopes that are *opposite reciprocals* of each other.

For example, what is the opposite reciprocal of 6?

Answer:

**Step 1 →** Take the 6 and write it as a fraction 

**Step 2 →** Flip it over (also known as the reciprocal) 

**Step 3 →** Change the sign (also known as the opposite) 

Therefore, the opposite reciprocal of 6 is .

1. Find the opposite reciprocal of each number.

a. -4 b.  c.  d. 0

1. Below are the equations of four lines.

   

1. Which pairs of lines are parallel?
2. Which pairs of lines are perpendicular?
3. Write the equation of a line parallel to the given line. Note: There is more than one correct answer.
4.  is parallel to
5.  is parallel to
6.  is parallel to
7.  is parallel to
8. Write the equation of a line perpendicular to the given line. Note: There is more than one correct answer.
9.  is perpendicular to
10.  is perpendicular to
11.  is perpendicular to
12.  is perpendicular to
13. Summarize what you have learned in this activity. Fill in the blank of each statement or circle the appropriate word to make the statement true.
14. Parallel lines have the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ slope.
15. Parallel lines have (same, different) *y*-intercepts.
16. Parallel lines \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ intersect each other.
17. Two lines with slopes that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reciprocals of each other are perpendicular to each other.
18. Perpendicular lines have (same/different) y-intercepts.
19. A pair of perpendicular lines intersects at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ angle.