

"Worksheet Solutions: When are Lines Parallel or Perpendicular?"

You will now use your Excel spreadsheet that graphs pairs of lines to investigate when lines are parallel or perpendicular.

Part I Graph the following pairs of lines. Find the slope of each line.

1. $-2x + y = 4$ $-2x + y = -2$ $-2x + y = 4$ slope = 2 $-2x + y = -2$ slope = 2	2. $1x + 2y = 2$ $1x + 2y = 4$ $1x + 2y = 2$ slope = $-1/2$ $1x + 2y = 4$ slope = $-1/2$	3. $-3x + 2y = 8$ $3x - 2y = 4$ $-3x + 2y = 8$ slope = $3/2$ $3x - 2y = 4$ slope = $3/2$
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4. What do you notice about the graphs in Problems 1 – 3?
What pattern do you see in the slopes of the lines in Problems 1 – 3?
These are examples of lines that are **parallel**.

The lines in the graphs never touch. They are parallel.
The slopes of both the lines are the same.

5. Write two other examples of lines that are parallel. Graph the lines to show that they are parallel.

There are many possible solutions. The lines should have slopes that are equal, and different y-intercepts.

Part II Graph the following pairs of lines. Find the slope of each line.

6. $-1x + 2y = 6$
 $2x + y = -1$

$$-1x + 2y = 6$$

slope = $1/2$

$$2x + y = -1$$

slope = -2

7. $-3x + 2y = 4$
 $2x + 3y = 6$

$$-3x + 2y = 4$$

slope = $3/2$

$$2x + 3y = 6$$

slope = $-2/3$

8. $-1x + y = 3$
 $x + y = -2$

$$-1x + y = 3$$

slope = 1

$$x + y = -2$$

slope = -1

9. What do you notice about the graphs in Problems 6 – 8?
What pattern do you see in the slopes of the lines in Problems 6 – 8?
These are examples of lines that are **perpendicular**.

The lines in the graphs intersect at right angles. They form a right angle.
The slopes of the lines are opposite and inverses of each other.

10. Write two other examples of lines that are perpendicular. Graph the lines to show that they are perpendicular.

There are many possible solutions. The lines should have slopes that are opposite inverses of each other.