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A video demonstration of the solution for *Example 1* is provided.

Example 1

Determine the slope of a line perpendicular to $(y+1)=-\frac{3}{4}(x-5)$.

The slope of the given line is $-\frac{3}{4}$. The negative reciprocal is $-\left(-\frac{4}{3}\right)=\frac{4}{3}$, so the slope of the new line is $\frac{4}{3}$.

Recall that the reciprocal of a number can be found by swapping the numerator and denominator. A number that isn't expressed as a fraction has a denominator of 1.

For example, the number 2 can also be expressed as $\frac{2}{1}$. Therefore, the reciprocal of 2 is $\frac{1}{2}$ and the negative reciprocal of 2 is $-\frac{1}{2}$.

Check Up

1. Determine an equation for a line that is perpendicular to $y = 5x + 6$ and has a y-intercept of –3.

2. Two lines have slopes of –0.2 and 4. Are the two lines perpendicular?

Compare your answers.

1. Determine an equation for a line that is perpendicular to $y = 5x + 6$ and has a y-intercept of –3.

   The slope of the original line is 5. The negative reciprocal of 5 is $-\frac{1}{5}$, so the slope of the new line is $-\frac{1}{5}$. The y-intercept is –3, so there is enough information to write an equation in slope-intercept form.

   $y = mx + b$

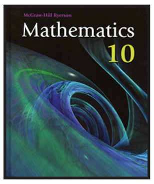
   $y = -\frac{1}{5}x - 3$

2. Two lines have slopes of –0.2 and 4. Are the two lines perpendicular?

   If the two lines are perpendicular, their slopes will have a product of –1.

   $-0.2(4) = -0.8$

   The two lines are not perpendicular.



For further information about parallel and perpendicular lines, see pp. 383 – 390 of *Mathematics 10*.

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Additional video examples related to this lesson have been provided.

Parallel lines have equal slopes and perpendicular lines have slopes that are negative reciprocals. These relationships can be used to help make sense of situations where parallel or perpendicular lines are involved.

Equations and Graphs of Linear Relations Summary

Using equations to represent linear relations has many advantages. Equations are concise, can represent an unlimited domain and range, and can be manipulated algebraically. With some linear equation forms, characteristics about the corresponding relation can be determined directly from the equation itself, and a graph can be quickly sketched or visualized. Lines that are parallel or perpendicular have related slopes, which can be used to solve problems involving these types of lines.