ALBERT

Name _____ Date _____

Slope and Similar Triangles Worksheet

Grade 8 · Common Core 8.EE.B.6

> Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Practice

Builds the skill step by step.

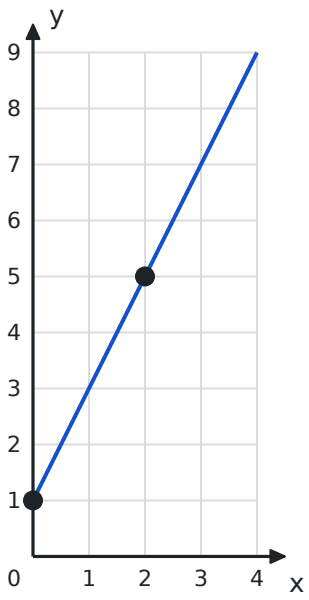
1. Find the slope of the line through (1, 2) and (3, 8).

2. Find the slope of the line through (0, 0) and (4, 2).

3. A line has a slope of 2 and a y-intercept of 5. Write its equation.

4. What is the y-intercept of $y = 3x - 4$?

5. Write the equation of the line shown on the grid.



6. Which line passes through the origin?

   A. $y = 5$

   B. $y = x - 5$

   C. $y = 5x$

   D. $y = 5x + 2$

7. A slope triangle on a line goes from (0, 0) right to (2, 0) and then up to (2, 6). What is the slope of the line?

8. Two slope triangles are drawn on the same non-vertical line. The triangles are...

   A. similar

   B. always congruent

   C. not related

   D. sure to have the same area

9. Find the slope of the line through (2, 7) and (5, 13).

10. Write the equation of the line through the origin with a slope of 4.

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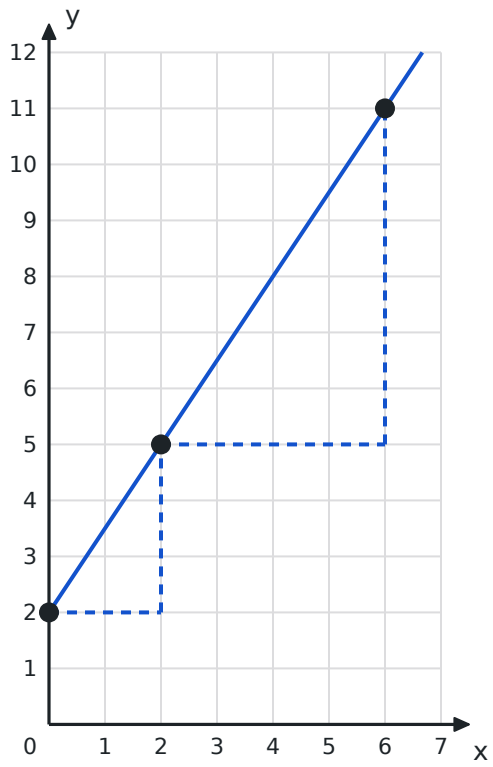
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On Level

Grade-level practice.

1. Two slope triangles are drawn on the line shown. Use them to find the slope of the line.



2. Find the slope of the line through $(-2, 3)$ and $(4, -9)$.

3. Write the equation of the line through $(0, -3)$ and $(2, 5)$.

4. Write the equation of the line through (1, 4) and (3, 10).

5. A slope triangle on a line has a run of 2 and a rise of 3. A larger slope triangle on the same line has a run of 6. What is its rise?

   A. 4.5

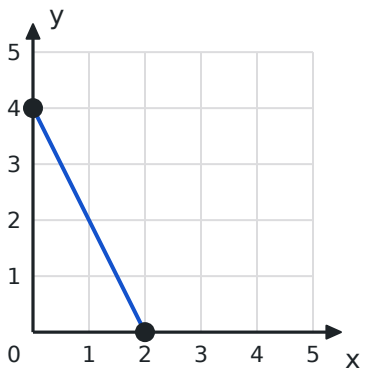
   B. 6

   C. 7

   D. 9

6. A line passes through (0, 0) and (3, 12). Write its equation.

7. Write the equation of the line shown on the grid.



8. Find the slope of the line through (−1, −1) and (3, 1).

9. Which equation has the same slope as $y = 3x - 7$ and passes through the origin?

   A. $y = 7x$

   B. $y = -7x$

   C. $y = 3x + 7$

   D. $y = 3x$

10. The line $y = mx + 6$ passes through $(2, 0)$. Find m.

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Challenge

Multi-step and word problems that stretch it.

1. Show that (1, 3), (3, 7) and (6, 13) lie on one line by finding the slope between each pair of neighbors. Then write the line's equation.

2. A slope triangle on a line has a run of 4 and a rise of 10. A similar slope triangle on the same line has a rise of 25. What is its run?

3. Ben finds the slope of the line through (2, 5) and (6, 7) as $(6 - 2) \div (7 - 5) = 2$. What is the correct slope?

   A. $-\frac{1}{2}$

   B. $\frac{1}{2}$

   C. 2

   D. 4

4. Write the equation of the line through $(-2, 1)$ and $(2, 9)$.

5. A gym charges a 20-dollar sign-up fee plus 15 dollars per month. Write an equation for the total cost c, in dollars, after m months.

6. Find the y-intercept of the line through (3, 10) and (5, 14).

7. Why is the slope the same between any two points on a non-vertical line?

   A. The rise is always 1.

   B. Every slope triangle on the line is the same size.

   C. Every line passes through the origin.

   D. All slope triangles on the line are similar, so rise ÷ run is always the same.

8. The point (k, 11) lies on the line $y = 4x - 1$. Find k.

9. A line passes through the origin and (−3, 6). Write its equation.

10. A line with a slope of 3.5 passes through (0, b) and (4, 18). Find b.