

Algebra 1 3.3

Use rate of change to solve problems

✓ 8th grade standard

Find the slope of a line*

Quiz 3.1-3.2

no Is it ever OK to divide by zero?

rate of change word prob.

slope - steepness

positive slope

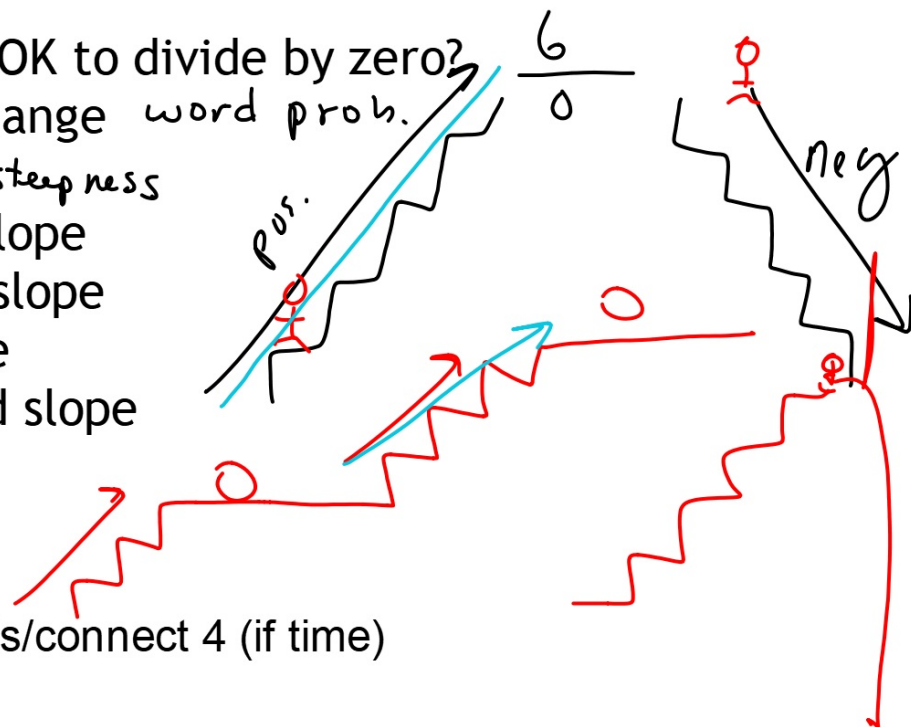
negative slope

zero slope

undefined slope

constant

linear



whiteboards/connect 4 (if time)

1 Rate of Change **Rate of change** is a ratio that describes, on average, how much one quantity changes with respect to a change in another quantity.

KeyConcept Rate of Change

If x is the independent variable and y is the dependent variable, then

$m =$ **rate of change** $= \frac{\text{change in } y}{\text{change in } x}$

vertical
horizontal

y rise
 x run



Run to the right!

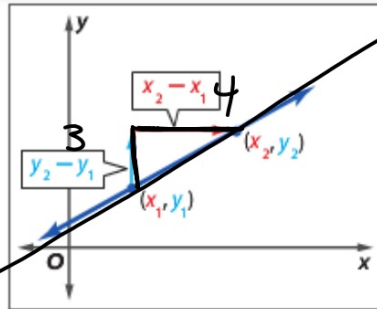
KeyConcept Slope

Words The slope of a nonvertical line is the ratio of the rise to the run.

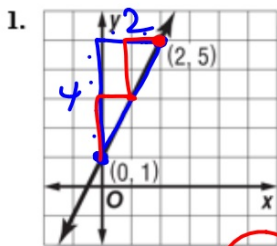
Symbols The slope m of a nonvertical line through any two points, (x_1, y_1) and (x_2, y_2) , can be found as follows.

$$m = \frac{y_2 - y_1}{x_2 - x_1} \begin{array}{l} \leftarrow \text{change in } y \\ \leftarrow \text{change in } x \end{array} \quad m = \frac{3}{4}$$

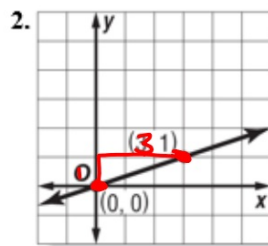
Graph



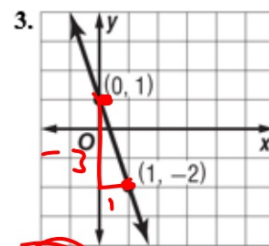
Find the slope of the line that passes through each pair of points.



$$m = \frac{4}{2} = \frac{2}{1}$$



$$m = \frac{1}{3}$$

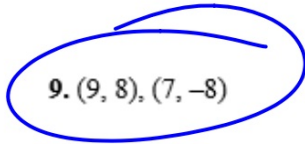


$$m = \frac{-3}{1} = -3$$

8. (2, 5), (-3, -5)

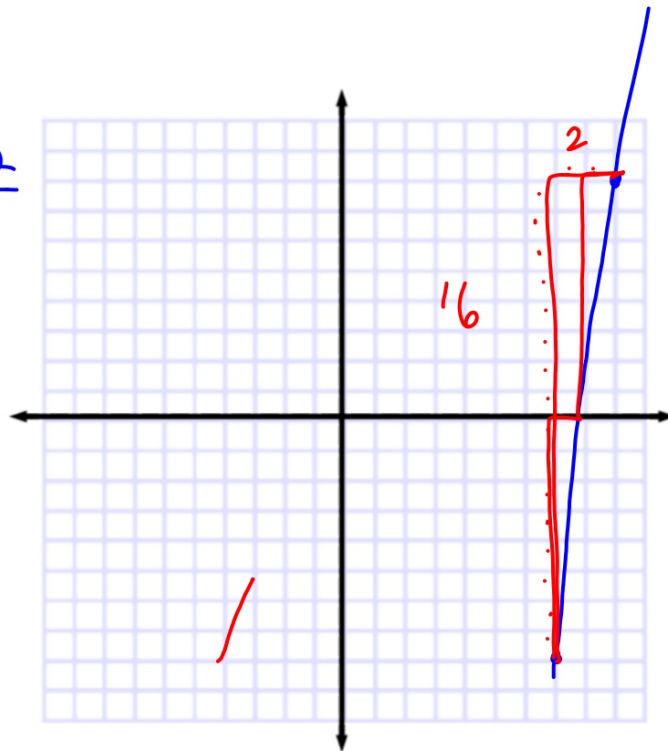


9. (9, 8), (7, -8)



Graph

$$m = \frac{10}{5} = \frac{2}{1}$$

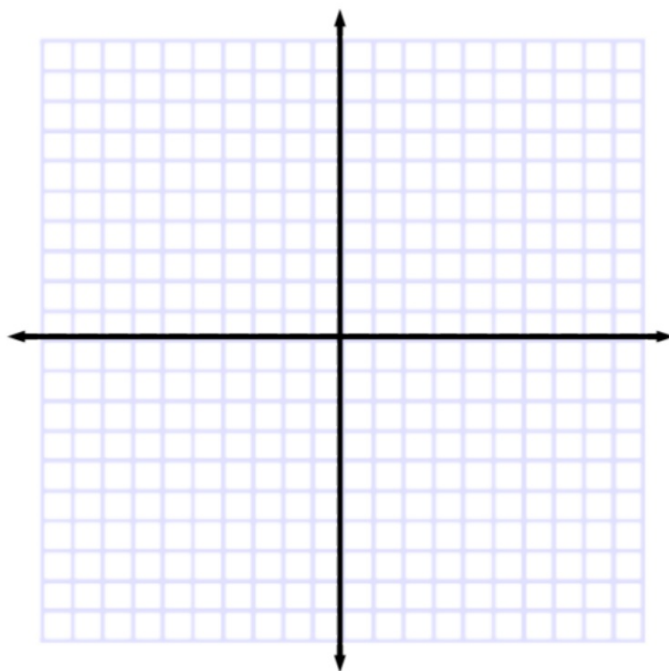


$$m = \frac{16}{2} = \left(\frac{8}{1}\right) = 8$$

10. $(-5, -8), (-8, 1)$

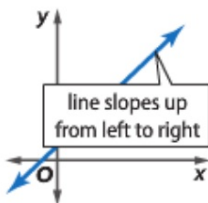
11. $(-3, 10), (-3, 7)$

3.3 prac.



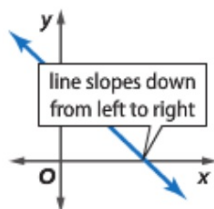
ConceptSummary Slope

positive slope



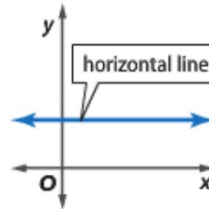
The function values are increasing over the entire domain.

negative slope



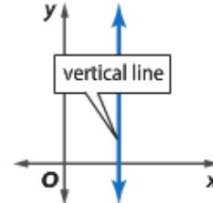
The function values are decreasing over the entire domain.

slope of 0



The function values are constant over the entire domain.

undefined slope



The relation is not a function.

zero slope
slope

undefined

bicycles

Connect 4 (if time)

Find the value of r so the line that passes through each pair of points has the given slope.

20. $(r, 3), (5, 9), m = 2$

21. $(5, 9), (r, -3), m = -4$

24. $(5, 3), (r, -5), m = 4$

25. $(7, r), (4, 6), m = 0$