Algebra 1 3.3 *8th grade standard

Use rate of change to solve problems

Find the slope of a line*

Is it ever OK to divide by zero?

rate of change word probl.

slope equations & (x,y)

positive slope

negative slope

zero slope

undefined slope

constant

linear

Quiz 3.1-3.2

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

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

$m =$ vert / horiz

rise / run y's / to the right

Run to the right!

KeyConcept Slope

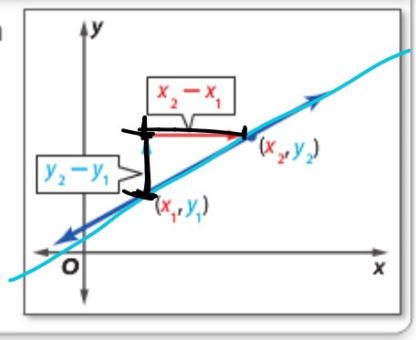
Words The slope of a nonvertical line is the ratio of the rise to the run.

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.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$ ← change in y / ← change in x

m: vert / horiz

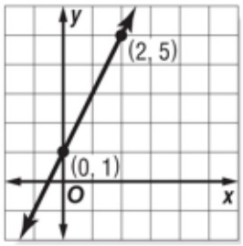
Graph



ratio = rise / run

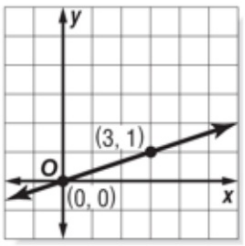
Find the slope of the line that passes through each pair of points.

1.



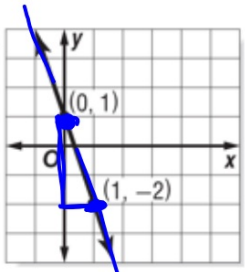
$m = \frac{2}{0} = \frac{2}{1} = 2$

2.



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

3.

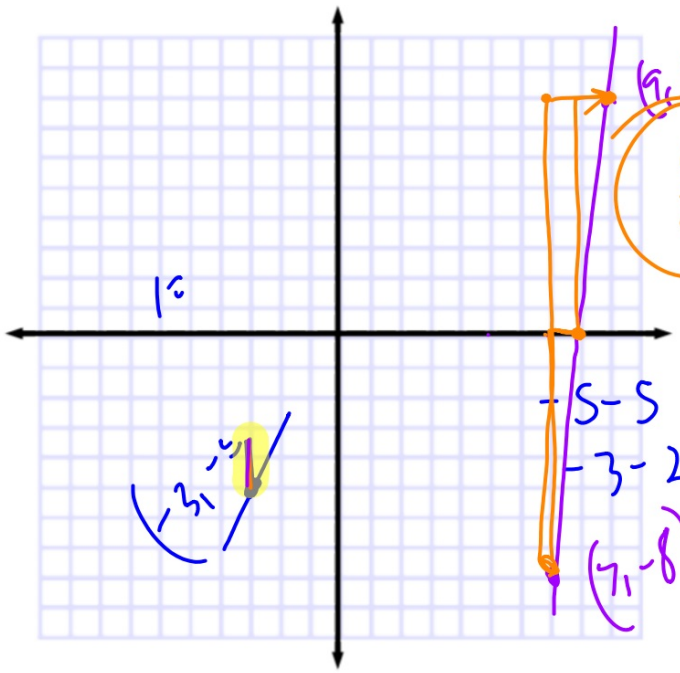


$m = \frac{-3}{1} = -3$

8. (2, 5), (–3, –5)

9. (9, 8), (7, –8)

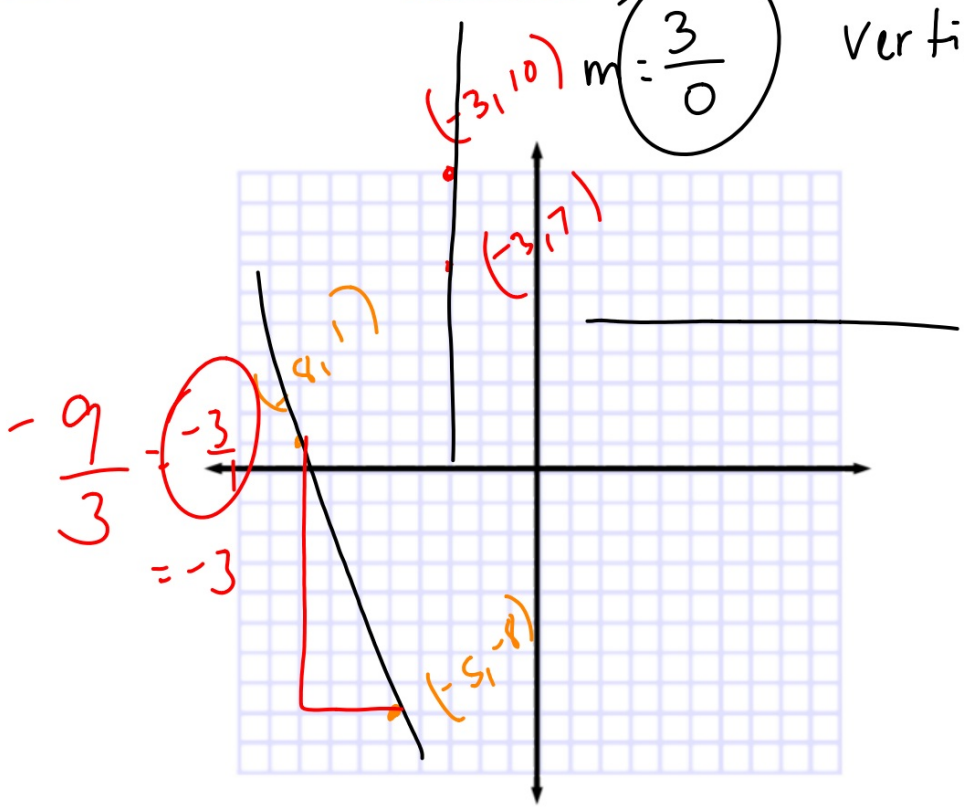
Graph



10. (–5, –8), (–8, 1)

11. (–3, 10), (–3, 7)

$m = \frac{3}{0}$ vertical

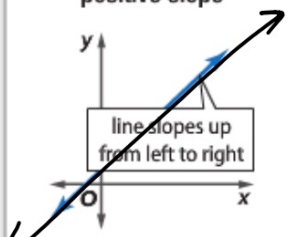


$-\frac{9}{3} = \frac{-3}{1}$

$= -3$

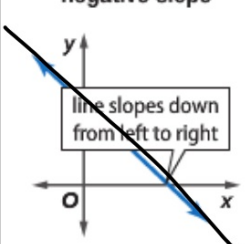
ConceptSummary Slope

positive slope



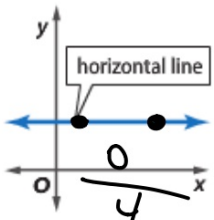
The function values are increasing over the entire domain.

negative slope



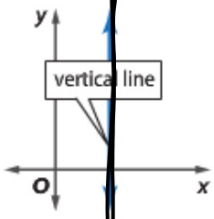
The function values are decreasing over the entire domain.

slope of 0



The function values are constant over the entire domain.

undefined slope



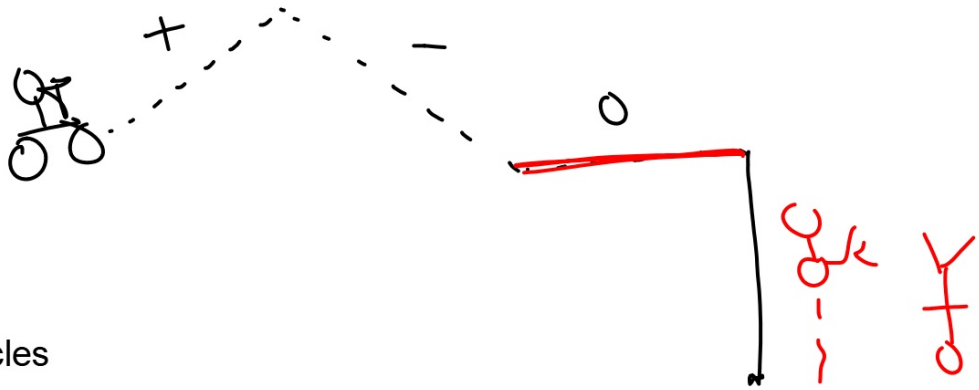
The relation is not a function.

$m = 0$

zero slope

undefined

slope



bicycles

Connect 4 (if time)

$$\frac{\text{rise}}{\text{run}}$$

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