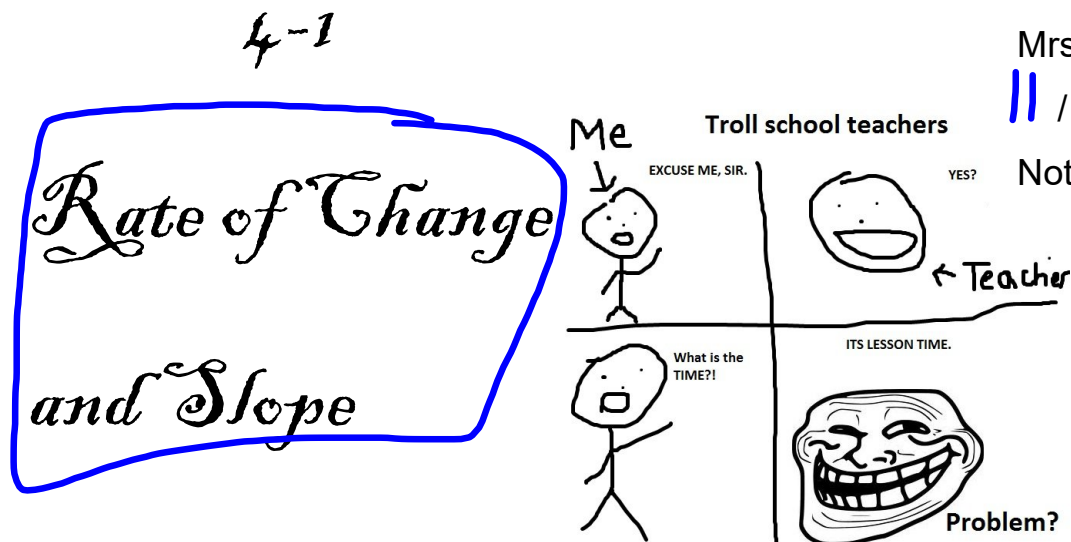


Your Name

Mrs. T

11 / 11 / 18

Notes



Objective: To be able to find the slope given a graph or two coordinates. To be able to use the slope formula with the slope and find missing coordinates.

Life Lesson/Skill: To be able to graph linear equations and write them with ease, we need to be able to find the slope and understand the slope formula.

Rate of Change

a ratio comparing one quantity to another

remember:

distance over time

$$\frac{\text{dist}}{\text{time}} = \text{Speed}$$

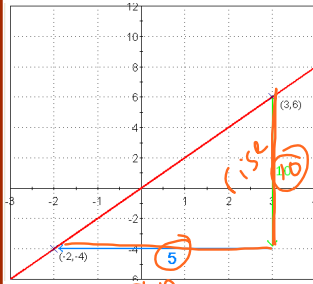
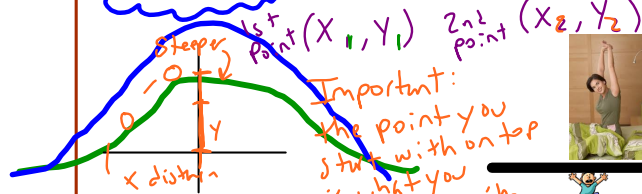
Slope

ratio of the change in y coordinate to the change in x coordinate

FORMULAS

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\text{change in y}}{\text{change in x}} = \frac{\text{rise}}{\text{run}}$$

the difference



$$6 - (-4) = 10$$

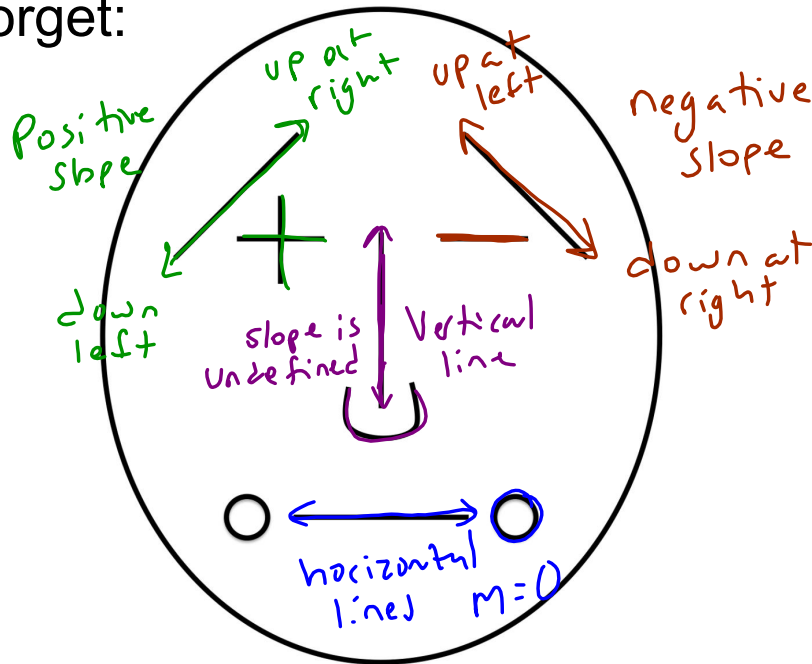
$$3 - (-2) = 5$$

$$\frac{10}{5} > \frac{6}{5}$$

$$m = \frac{\text{rise}}{\text{run}} = \frac{10}{5} = 2$$

bigger slope

Don't forget:



MR. SLOPE GUY

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Finding Slope from Points

1. label the first coordinates x_1 and y_1
2. label the second coordinates x_2 and y_2
3. Substitute and simplify

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

1st 2nd
 $(6,3), (7,-4)$
 x_1, y_1, x_2, y_2

x_1, y_1, x_2, y_2
 $(-2,-5), (-7,8)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - 3}{7 - 6} = \frac{-7}{1} = -7$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - (-5)}{-7 - (-2)} = \frac{13}{-5}$$

$$m = \frac{13}{-5}$$

$$m = -7$$

doesn't matter which point you start with

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{3 - (-4)}{6 - 7} = \frac{7}{-1} = -7$$

Finding Slope from a Table

1. subtract the ys
2. subtract the xs
3. divide y difference/x difference

Or pick two points and use $m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = 2$

$m = 0$

$m = \text{Undefined}$

x	y
-3	-1
-1	3
0	5
...	...
4	13

x	y
-4	-2
0	-2
4	-2

x	y
5	-3
5	-1
5	1

$$m = \frac{4 - 0}{2 - 0} = \frac{4}{2} = 2$$

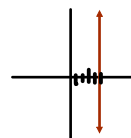
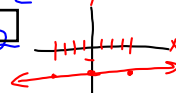
slope $m = 2$

$$m = \frac{-2 - (-2)}{4 - 4} = \frac{0}{0} = 0$$

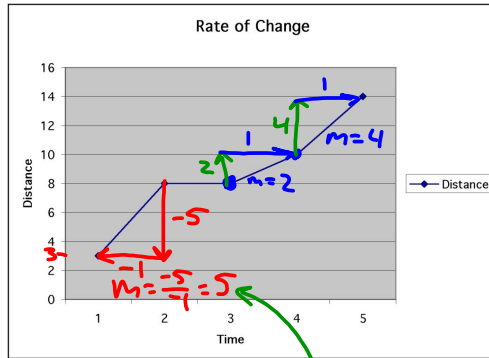
$m = 0$ means horizontal line

$$m = \frac{-1 - (-1)}{5 - 5} = \frac{-2}{0}$$

can't divide by 0
 slope is undefined means vertical line



Finding Slope from a graph



What is the slope from 3 seconds to 4 seconds?

just look at rise and run and count spaces
 going up is positive
 going down is neg.
 $\frac{\text{rise}}{\text{run}} = \frac{4}{1} = 4$
 $m = 4$
 going right is pos
 going left is neg

two negative directions equals positive slope

Given a point and Slope

Find the other point

Plug givens into the slope formula and solve for the missing one using cross products.

$(-2, r), (6, 7), m = 0.5 = \frac{1}{2}$
 write decimals as fractions
 $0.5 = \frac{r-7}{2-6}$
 $\frac{1}{2} = \frac{r-7}{-2-6}$
 $1(2-6) = 2(r-7)$
 $-2-6 = 2r-14$
 $-8 = 2r-14$
 $-14 \quad +14$
 $\frac{1}{2} = \frac{2r}{2}$
 $3 = r$
 the point is $(-2, 3)$

$(1, 3), (r, 4), m = -5$
 $\frac{-5}{1} = \frac{(3)-(4)}{1-r}$
 $-5(1-r) = 7$
 $-5+5r = 7$
 $+5 \quad +5$
 $5r = 12$
 $r = 2\frac{2}{5}$ or 2.4
 (2.4, 4)

Homework:

Textbook pg. 141 #1,2, 5-13