

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

### Unit 3A Day 3 and 4: Rates of Change on a Graph

Focus Question: How do I find rates of change from a graph?

A. Slope in Context:

Slope (rate of change) is referred to as  $\frac{\Delta y}{\Delta x}$ .

When a graph is decreasing, the constant rate of change is Negative.

When a graph is increasing, the constant rate of change is positive.

When a graph is constant (or horizontal), the rate is 0.

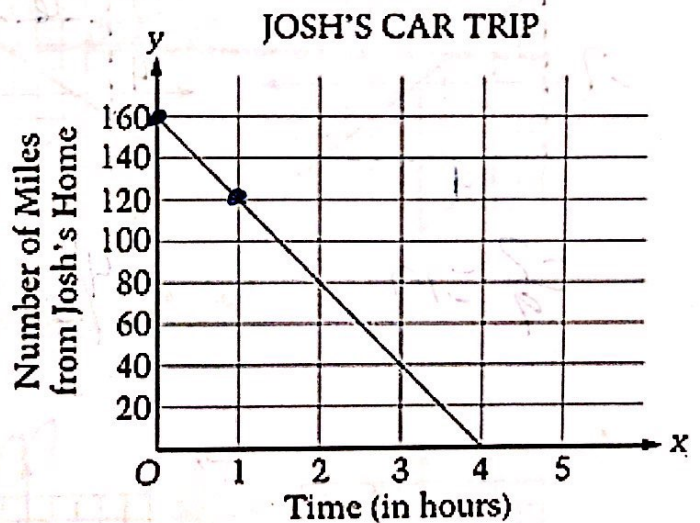
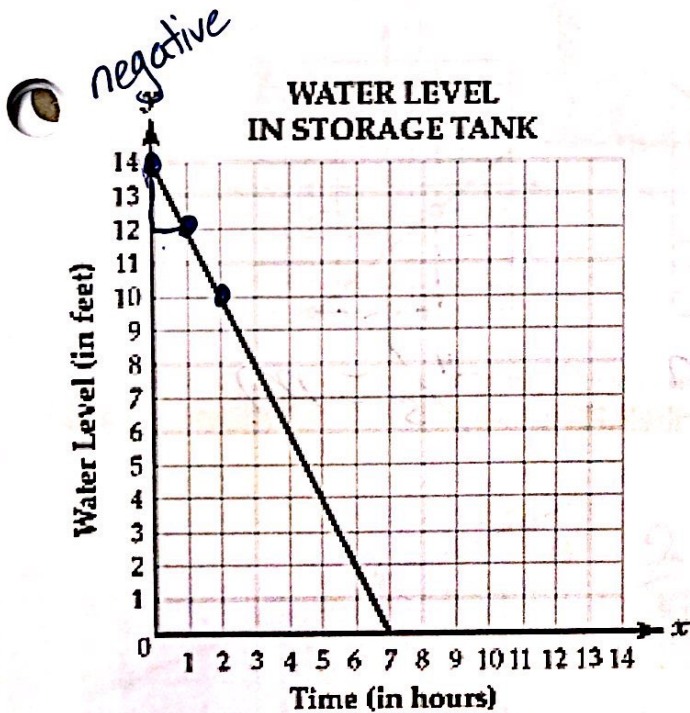
When a graph is a vertical line, the slope is undefined.

\*When we find a rate of change on a graph, it is conventional to leave it as the ratio (fraction) because it is easier to graph whole number rises and runs (and not all independent and dependent variables come in decimals...ie. can you have 0.7 people per room?).

Slope is represented by the letter m for movement (the path along which the object is moving.)

$$y = mx + b$$

Find the find the slope of each graph. Then, explain what the rate means



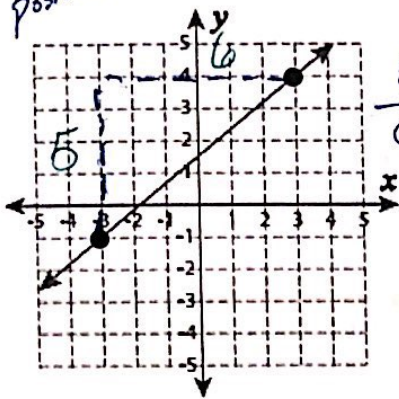
$m = \frac{-2}{1}$  This means.... The water level is decreasing by 2 feet every hour.

$m = \frac{-40}{1}$  This means... Josh is getting 40 miles closer to home every hour.

B. Not all graphs have labels on the x and y axis (context), but you can still find the slope!

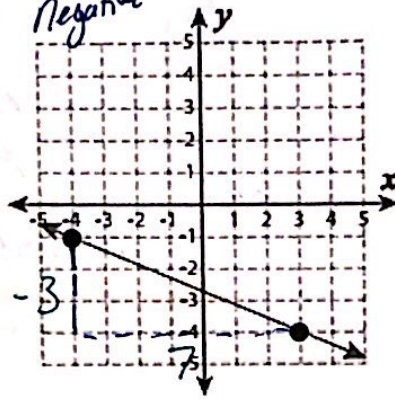
Give the rate of change for each graph below.

1) Positive



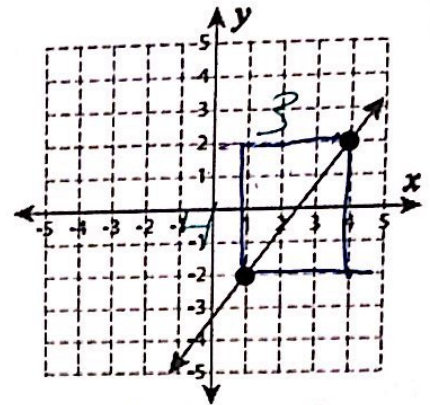
$$m = \frac{5}{6}$$

2) Negative



$$-\frac{3}{7} = m$$

3)

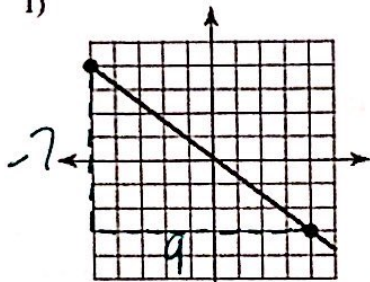


$$\frac{4}{3} = m$$

C. Partner Practice

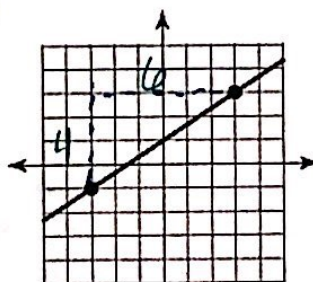
Find the rate of change from each graph below.

1)



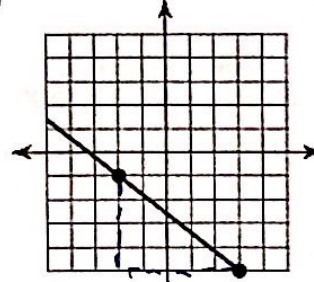
$$-\frac{7}{9} = m$$

2)



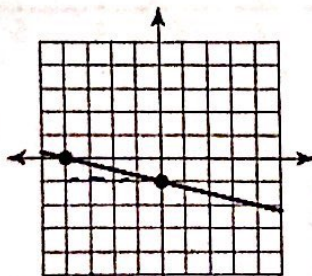
$$\frac{1}{3} = m$$

3)



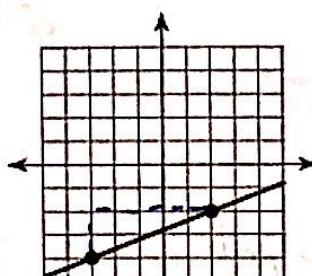
$$-\frac{4}{5} = m$$

4)



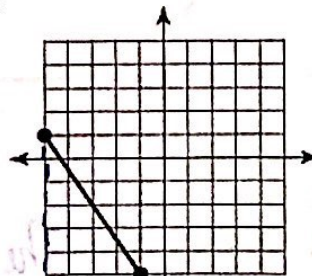
$$-\frac{1}{4} = m$$

5)



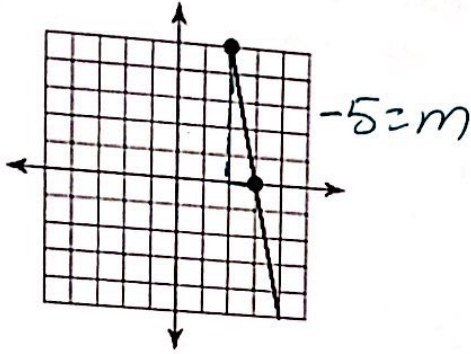
$$\frac{2}{5} = m$$

6)

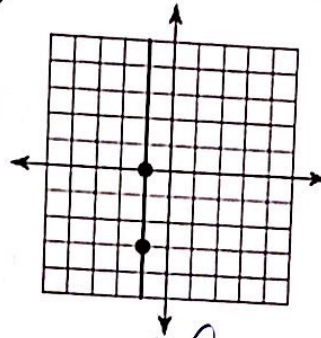


$$-\frac{3}{2} = m$$

7)

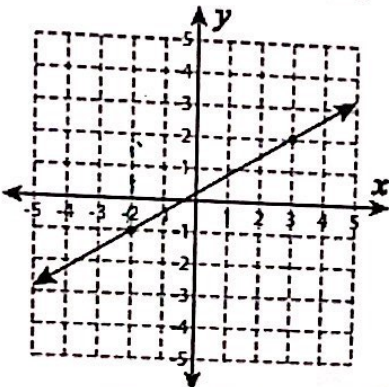


8)



undefined

9) Tommy was given the graph below and asked to find the slope. He said the answer was  $m = -\frac{5}{3}$ .

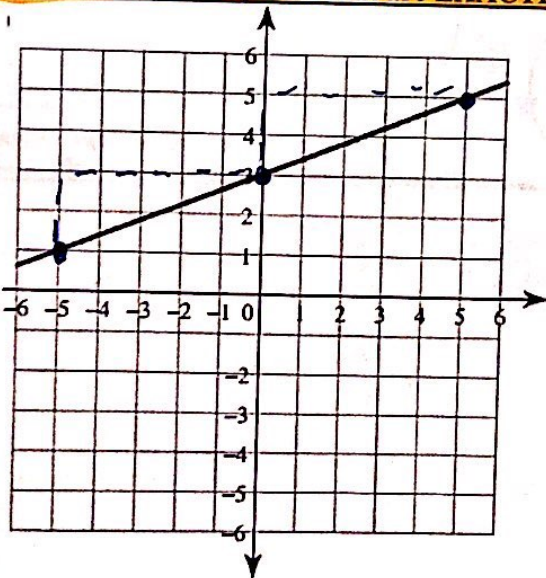


Explain his error(s) in reasoning.

- 1) Tommy is trying to find the slope of a graph
- 2) We are being asked to believe is  $m = -\frac{5}{3}$
- 3) His error is that the line is positive and
- 4) did run/rise instead of rise/run
- 4) The slope is  $m = \frac{3}{5}$

Please Be Careful... Sometimes you might have to find your own points to use on the graph.

Remember to find points that are EXACTLY where the line meets "a corner!"



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