

# 5.4 Slope as Rate of Change HW

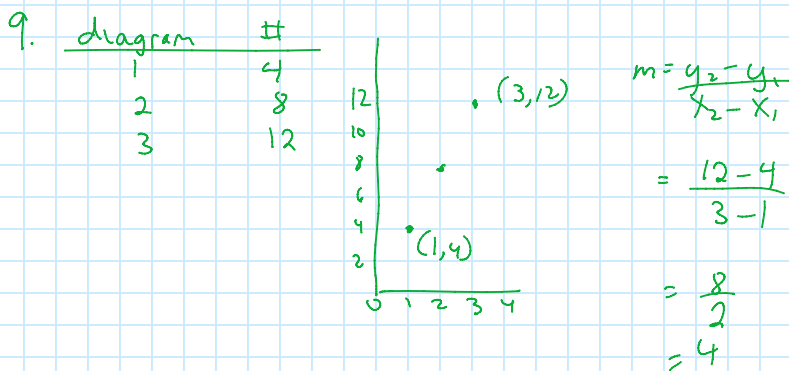
May 4, 2017 5:48 PM

pg 268 # 6, 7, 9, 10, 12, 14, 18

6. year is independent, price is dependent

$$\begin{aligned} \text{rate of change} &= \frac{\text{change depend}}{\text{change indep}} = \frac{1.78 - 1.45}{2006 - 2003} \\ &= \frac{0.33}{3} \\ &= 0.11/\text{year} \end{aligned}$$

7. rate of change =  $\frac{\text{change depend}}{\text{change indep}} = \frac{16 - 2}{61 - 0} = \frac{14}{61} = 0.23 \text{ cm/day}$



$m=4$  means the # toothpicks increases by 4 from one diagram to the next

10. girls: roc is 8.5 cm/y  
boys: roc is 9.5 cm/y

to graph, find 2 points for each kid and draw a line through each pair:

Helen: (12, 150) and (14, 167) I chose to use age 14, but any age would do. Just go up by 8.5 cm per year!

John: (12, 146) and (14, 165)

look for where the line crosses (should be at 16)

12.

Floor area (m <sup>2</sup> )	min Vol (L)
25	39
50	78
75	117

b) ROC =  $\frac{y_2 - y_1}{x_2 - x_1}$   
 $= \frac{78 - 39}{50 - 25}$   
 $= \frac{39 \text{ L}}{25 \text{ m}^2}$   
 $= 1.56 \text{ L/m}^2$

c) If floor area is 140 m<sup>2</sup>, how much water is needed?

I can make an equation to solve the problem. I know slope is 1.56 but I need b. I make a TOV to help find the initial value:

x	y
0	0
25	39
50	78
75	117

I see that the volume goes up 39L for every 25 m<sup>2</sup>, so it would be 0L for 0 m<sup>2</sup> → which makes sense!  
 so  $y = 1.56x + 0$

$y = 1.56x$  where y is volume and x is area  
 $y = 1.56(140)$   
 $y = 218.4 \text{ L}$  I need 218.4 L of water.

The truck pumps 200L/min. How long to pump 218.4L?

$$\frac{x \text{ min}}{218.4} = \frac{1 \text{ min}}{200L} \quad x = \frac{218.4}{200} = 1.1 \text{ min}$$

14. Speed is rate of change, so calculate slope for each line:

Car A: points are (0,0) and (6,360)  $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{360 - 0}{6 - 0} = 60 \text{ km/h}$

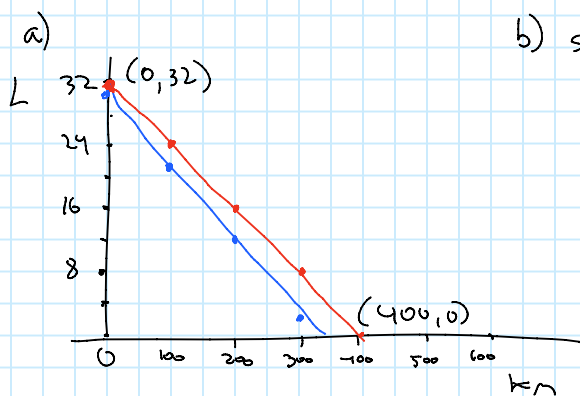
Car B: points are (1,0) and (6,480)  $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{480 - 0}{6 - 1} = \frac{480}{5} = 96 \text{ km/h}$

Car B is going 36 km/h faster than car A.

The point of intersection shows when both cars were at the same place at the same time - car B left later so this point represents where it caught up to car A.

18. Kims car fuel efficiency: 8L/100km, 32L tank

↳ she uses 8L for every 100km driven



b) slope =  $\frac{y_2 - y_1}{x_2 - x_1}$   
 $= \frac{0 - 32}{400 - 0}$   
 $= -\frac{32}{400}$   
 $= 0.08 \text{ L/km} \rightarrow \text{her fuel efficiency!}$

c) 25% more gas in the city:  $8 \times 1.25 = 10$  so 10L/100km  
↑ calculating 25% more  
blue line graphs this one ☺

use (0,32) and (200,12) to find new slope  $\frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - 32}{200 - 0} = \frac{-20}{200} = -0.1 \text{ L/km}$