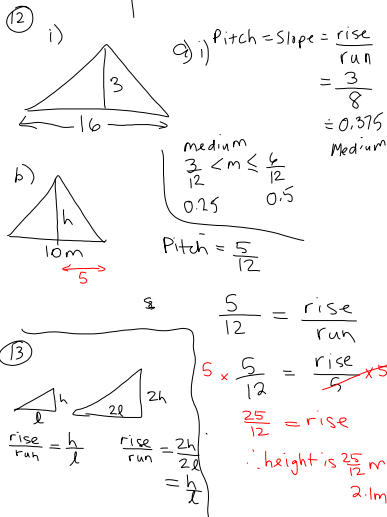
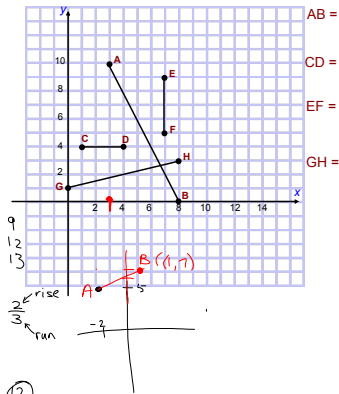
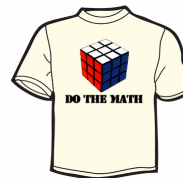


1. Find the slope of each line segment

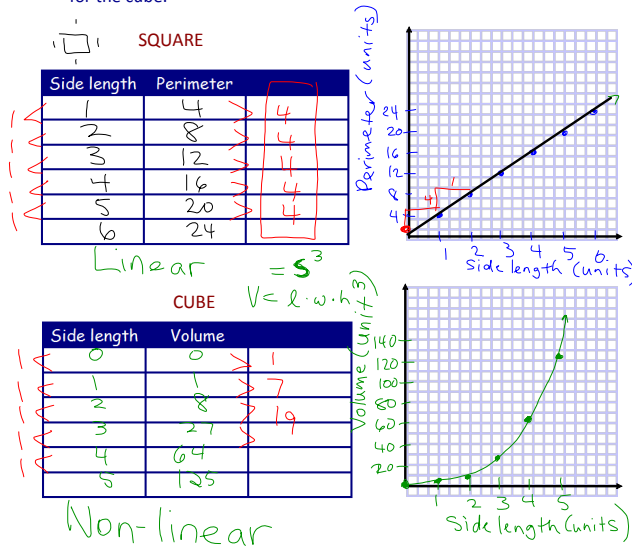


4.2 Slope - Day 2



Investigate!

- Use cube-a-links to help you find the relationship between
 - A square's side length and its perimeter.
 - A cube's side length and its volume.
 - Plot the data for each relationship and determine whether they are linear or non-linear.
 - Look for a pattern in the values of the dependent variable for the square. Investigate whether the same pattern holds true for the cube.



4.2 Slope as a Rate of Change

Rate of Change: the change in one variable relative to the change in another.

↳ * Slope, with units

Ex. 1 Usain Bolt's world record for the 100 m sprint is 9.58 s.

Calculate his **rate of change**. = slope = constant of variation

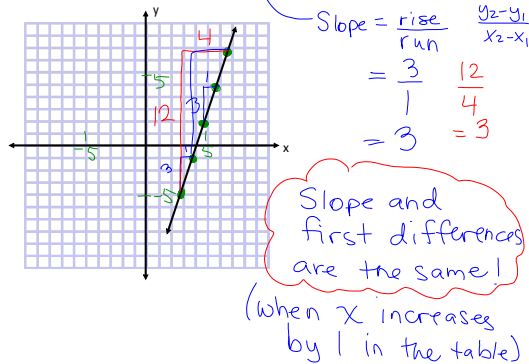
$$\frac{\text{dep}}{\text{ind}} = \frac{\Delta y}{\Delta x} = \frac{100\text{m}}{9.58\text{s}} = 10.44 \text{ m/s}$$

First Difference: the difference between two consecutive y-values in a table in which the differences between the x-values is constant. For example:

x	y	First Differences
3	-5	
4	-2	$-2 - (-5) = 3$
5	1	$1 - (-2) = 3$
6	4	3
7	7	3

The 1st differences are 3. What does that tell you about the graph?
Linear

Graph this relationship and calculate the slope.



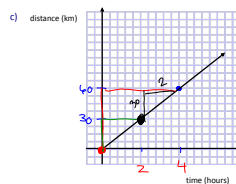
Ex. Kelsey and Gabby had cycled 30 km after two hours and 60 km after four hours.
a) Create a table of values and calculate the 1st differences.
b) Calculate their rate of change.
c) Graph the relationship.
d) Calculate the slope.



a)

Time (hrs)	Distance (km)	1 st Difference = Δy
0	0	
2	30	30
4	60	30

b) rate of change = $\frac{\text{change in } y}{\text{change in } x}$
 $= \frac{30 \text{ km}}{2 \text{ hrs}}$
 $= 15 \text{ km/hrs}$ * Include Units



d) Slope = $\frac{\text{rise}}{\text{run}}$
 $= \frac{60}{4} = \frac{30}{2} = 15$
 Slope = rate of change

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

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Slope} = \frac{\Delta y}{\Delta x}$$

Slope = rate of change

Slope = first differences (when x & y_1)

Rate of Change = Slope

Homework:
page 267 #C1, 2-5, 8b, 12
page 275 #C1, C2, 2
page 286 #13

