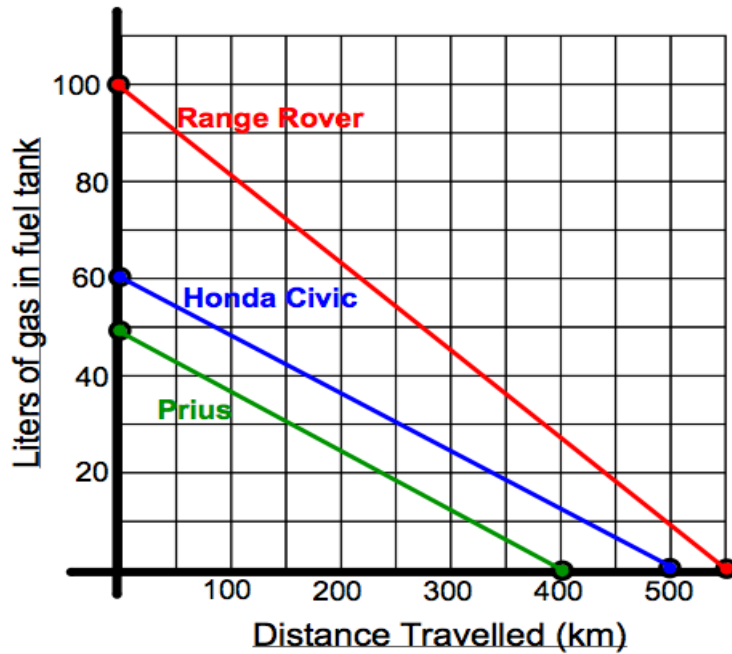


Section 5.4 – Slope as a Rate of Change

MPM1D

Jensen

Part 1: Do It Now



1. The independent variable is _____
The dependent variable is _____
2. How can you determine the rate of fuel consumption using this data?
3. Determine the rate of gas consumption for each vehicle and then rank them in order of efficiency.

Vehicle	2010 Range Rover	2011 Prius	2007 Honda Civic
Rate of gas consumption			
Efficiency ranking			

Part 2: Connecting Slope and Rate of Change

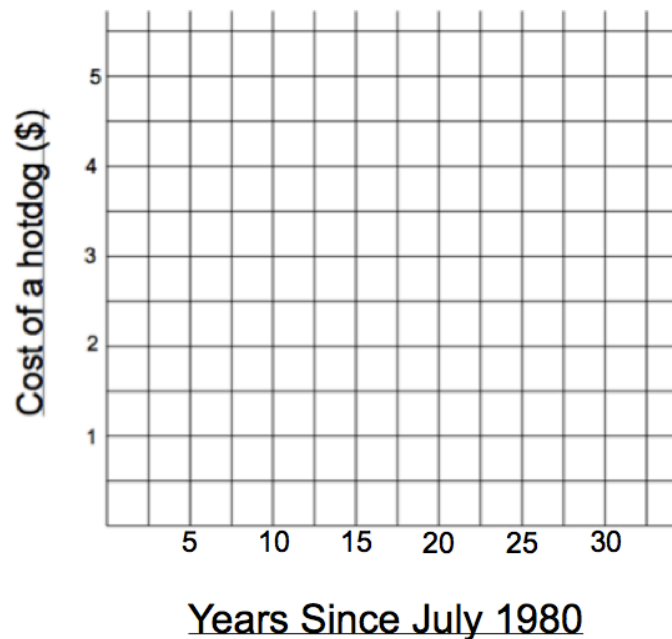
From the Do It Now question we have discovered that slope = rate of change. Look at the following table to see further how they are connected. How the linear equation is represented determines the terminology we use describe the slope.

Word problem	Table	Graph	Equation
m is the rate of change	$m = \frac{\Delta y}{\Delta x}$	$m = \frac{\text{rise}}{\text{run}}$	$m = \text{slope}$

Example 1:

The cost of a hot dog at the Rogers Centre has been going up for several years. Graph the data. Let x be the number of years since July 1980.

Years since July 1980	Cost of a hotdog (\$)
0	2.50
5	2.75
10	3.00
15	3.25
20	3.50
25	3.75
30	4.00



a) Determine the slope using the graph

Rise = _____ Run = _____ Slope = _____

b) Determine the rate of change of the cost of hot dogs using the table.

Remember:

$$\text{Rate of change} = \frac{\Delta y}{\Delta x}$$

c) Write an equation to represent the cost of a hot dog based on the number of years since July 1980. What part of the equation represents the slope?

Example 2: Mr. Jensen is training for a triple marathon and runs every day before school. This morning he ran 5 km in 20 minutes.

a) Calculate the rate of change of Mr. Jensen's distance from his starting point. (in this case rate of change is = average speed)

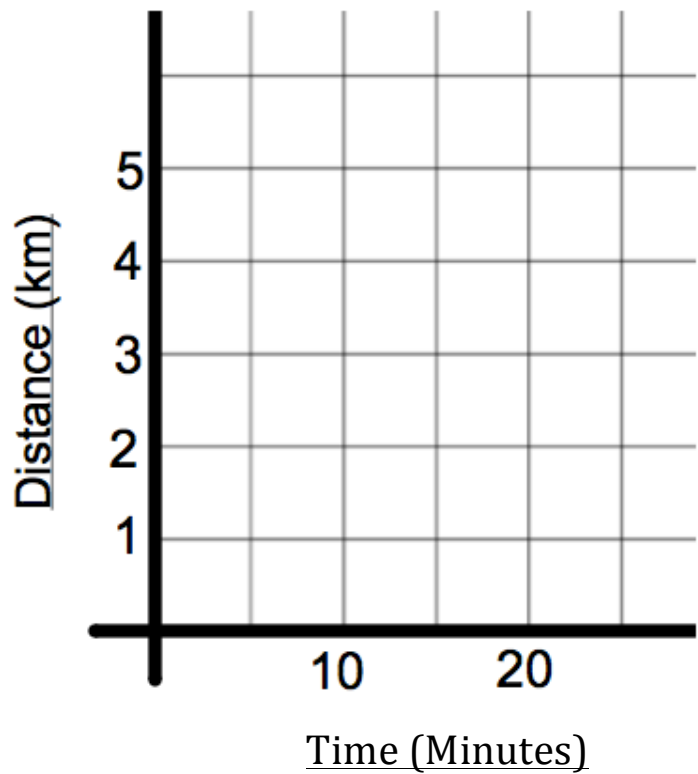
Dependent variable: _____

Independent variable: _____

$$\text{Rate of change} = \frac{\Delta \text{dependent variable}}{\Delta \text{independent variable}}$$

Rate of change (speed) =

b) Graph distance as it relates to time



c) Calculate the slope of the line from the graph

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

d) Explain the meaning of the rate of change and how it relates to the slope of the graph