

What's Going On?

Checking In

Minds on

Reviewing Slope

Action!

Slope as a rate of change

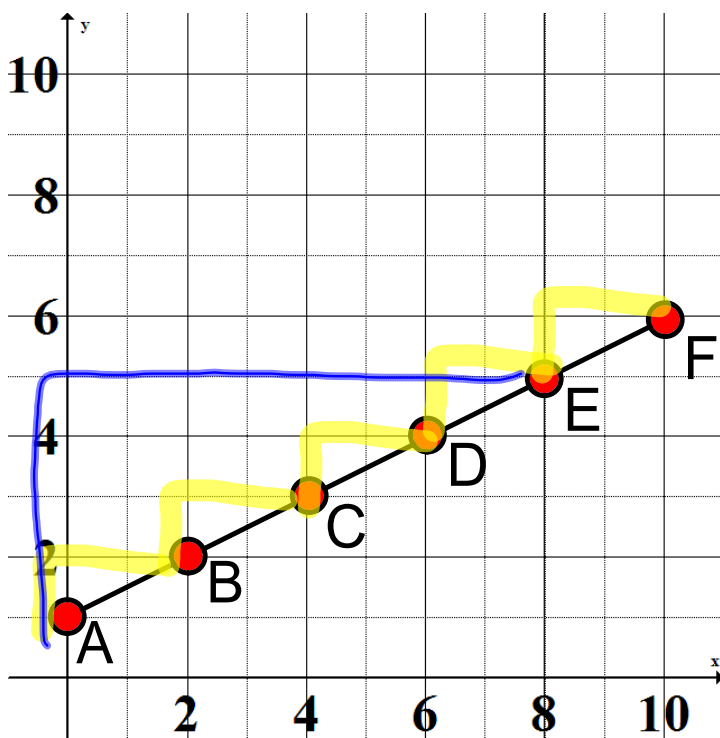
Consolidation

Fuel Consumption

Learning Goal - I will understand how slope can be interpreted as a rate of change!

Minds on

What's the Slope?



Slope AB = $\frac{1}{2}$

Slope CD = $\frac{1}{2}$

Slope EF = $\frac{1}{2}$

Slope AE = $\frac{1}{2}$

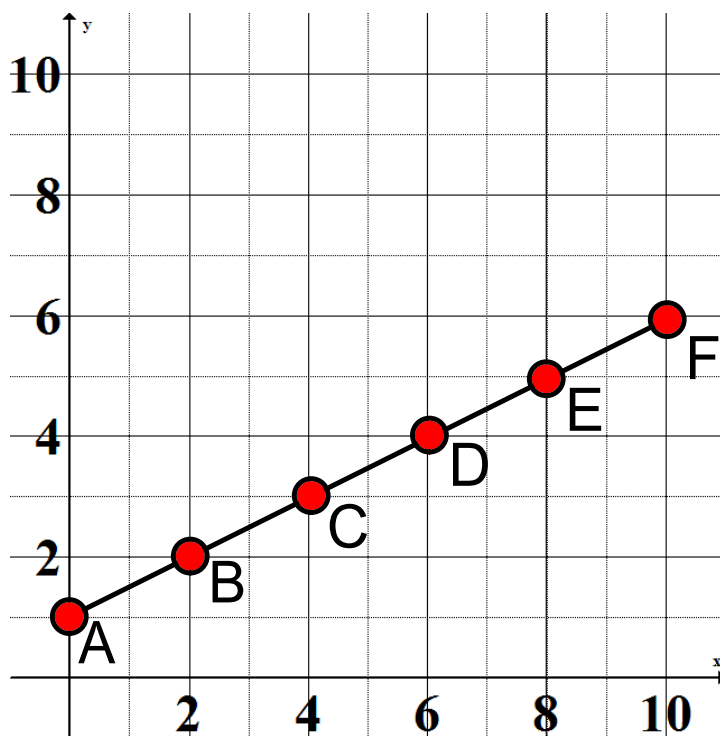
Slope BF = $\frac{1}{2}$

Slope CF = $\frac{1}{2}$

$\frac{4}{8} = \frac{1}{2}$

Minds on

What's the Slope?



Because all of the points fall on the same line, all of the line segments we can make have the same slope!!!

Minds on

Fill in the Blanks

NOTE

The slope is a measure of the steepness of a line segment.

The slope of a line segment is calculated as the $\frac{\text{rise}}{\text{run}}$ between any two points.

Minds on

Fill in the Blanks

A line segment rising from left to right has a positive slope.

A line segment falling from left to right has a negative slope.

Horizontal lines have a slope of zero.

The slope of a vertical line is undefined.

Minds on

Tough Question? $(5, 3)$ ✓

A line segment has an end point of $(3, 6)$.

If the slope of the line segment is $-\frac{3}{2}$ determine the coordinates of 3 more points on the line.

$(1, 9)$ $(7, 0)$
 $(9, -3)$

Minds on

A line segment has an end point of $(3, 6)$.

If the slope of the line segment is $-\frac{3}{2}$ determine the coordinates of 3 more points on the line.

$(-3, 15)$, $(-1, 12)$, $(1, 9)$

The line segment has a negative slope, therefore we know it is FALLING. Specifically, it is falling 3 units down for every 2 units it moves to the right.

To get the y-value, just subtract 3 from the original y-value of 6.

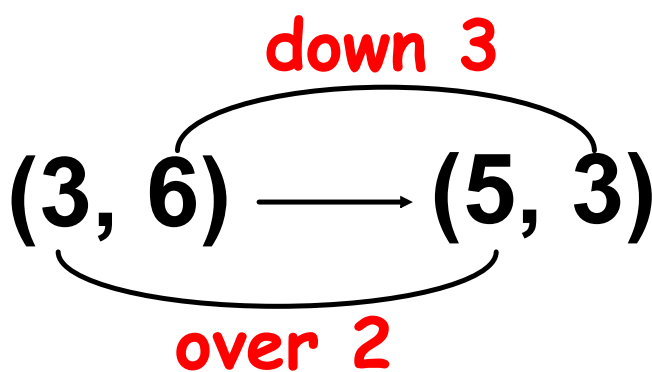
To get the x-value, add 2 to the original x-value of 3.

***Don't get tricked! Remember the slope is rise over run (change in y OVER change in x) not the other way around!

Consolidation

A line segment has an end point of $(3, 6)$.

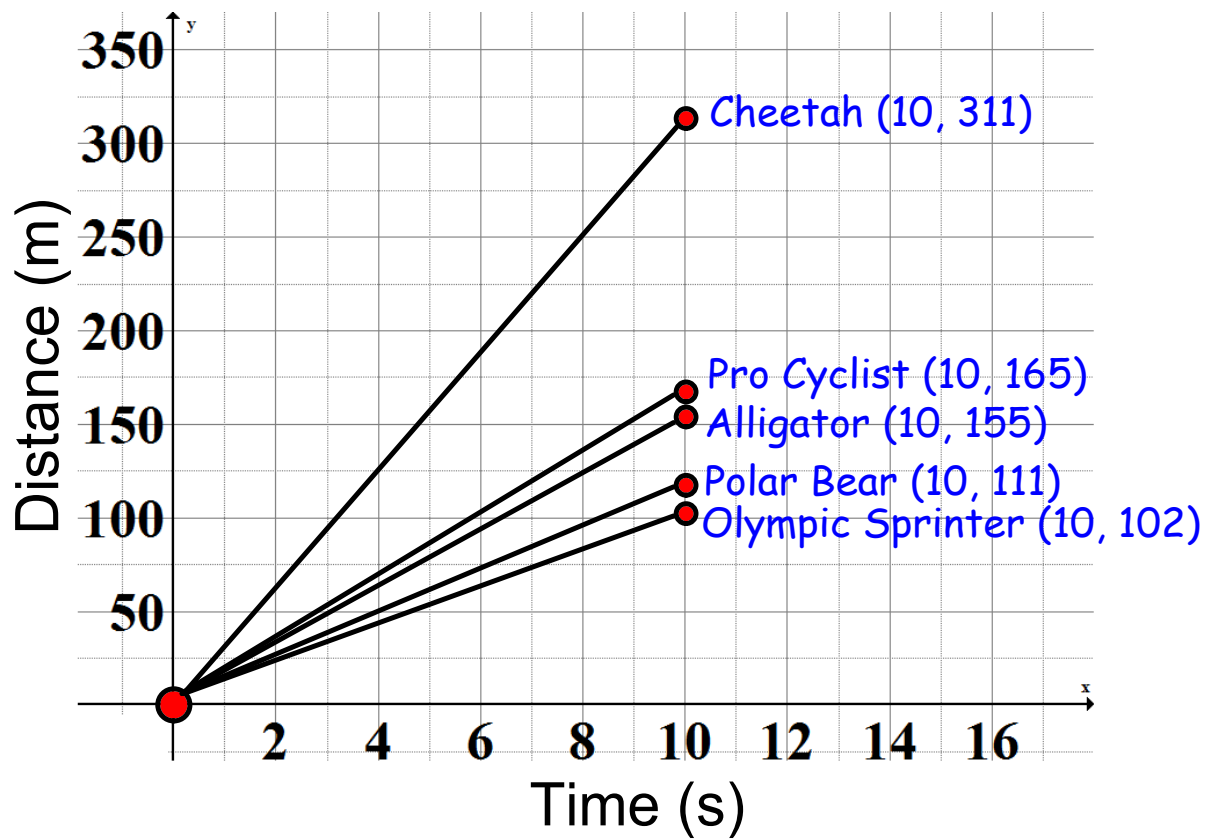
If the slope of the line segment is $-\frac{3}{2}$ determine the coordinates of 3 more points on the line.



To get more points,
just repeat the
process using the
new point!



Who's the Fastest?



Each ordered pair represents (time, distance)

How do we determine the speed of each person/animal?

	time	dist.	
Cheetah	(10,	311)	31.1
Pro Cyclist	(10,	165)	16.5
Alligator	(10,	155)	15.5
Polar Bear	(10,	111)	
Olympic Sprinter	(10,	102)	

Divide the distance travelled, by the time taken to travel that distance!

(or)

Divide the dependent variable by the independent variable!

Slope as a Rate of Change

The rate of change is the change in distance divided by (over) the change in time.

Cheetah (10, 311) →	31.1 m/s
Pro Cyclist (10, 165) →	16.5 m/s
Alligator (10, 155) →	15.5 m/s
Polar Bear (10, 111) →	11.1 m/s
Olympic Sprinter (10, 102) →	10.2 m/s

Unit Rates and Rate of Change

rate of change - a change in one quantity relative to the change in another quantity.

SAME AS SLOPE!!

Unit Rates and Rate of Change

unit rate - a ratio of two different measurements where the second term is 1.

Speed (distance travelled per 1 hour)

Price (amount of money per 1 orange)

When we talk about a rate of change we are usually talking about a unit rate.

A bag of 30 apples costs \$10.99

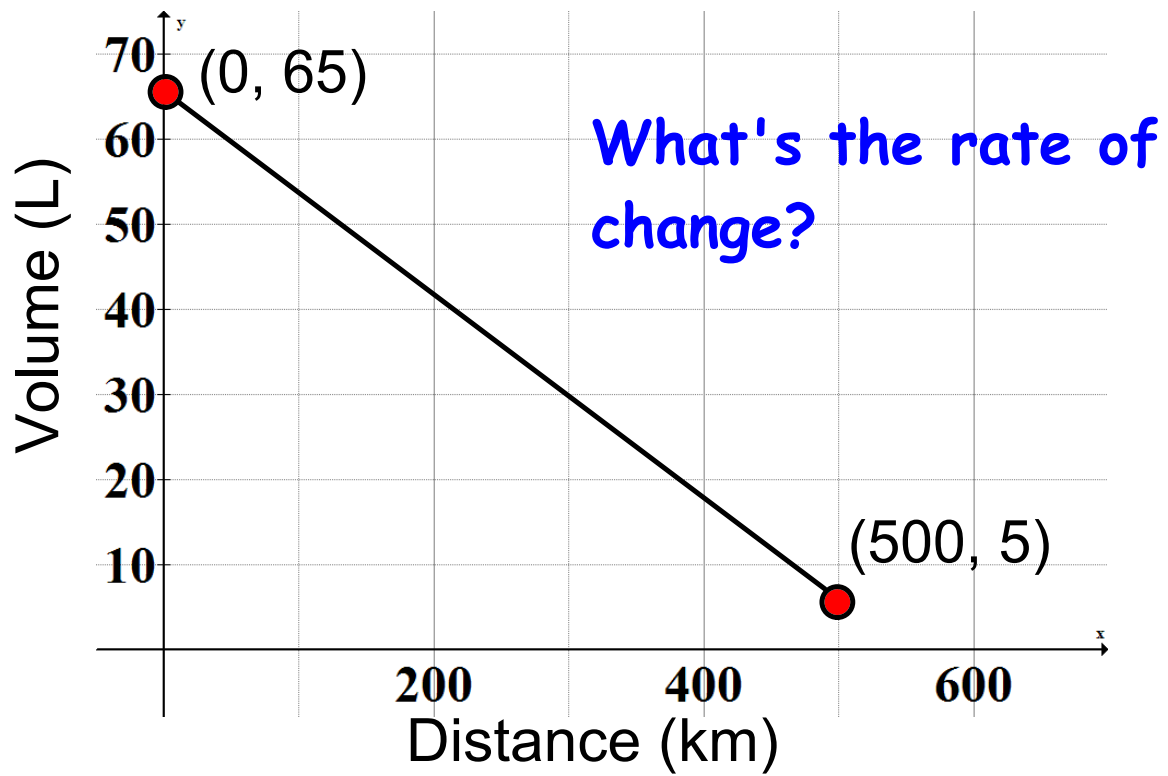
What is the unit rate?

Price per apple

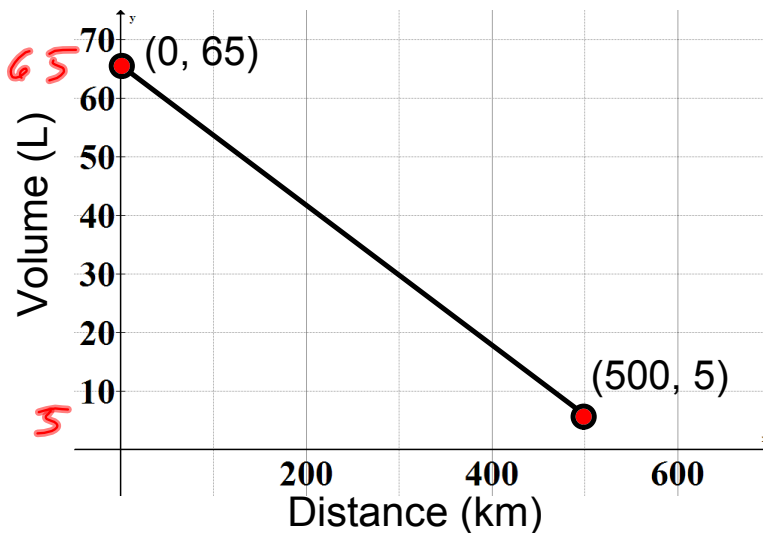
$$10.99 \div 30$$

$$= 0.37 \text{ \$/apple}$$

Fuel Consumption



Fuel Consumption



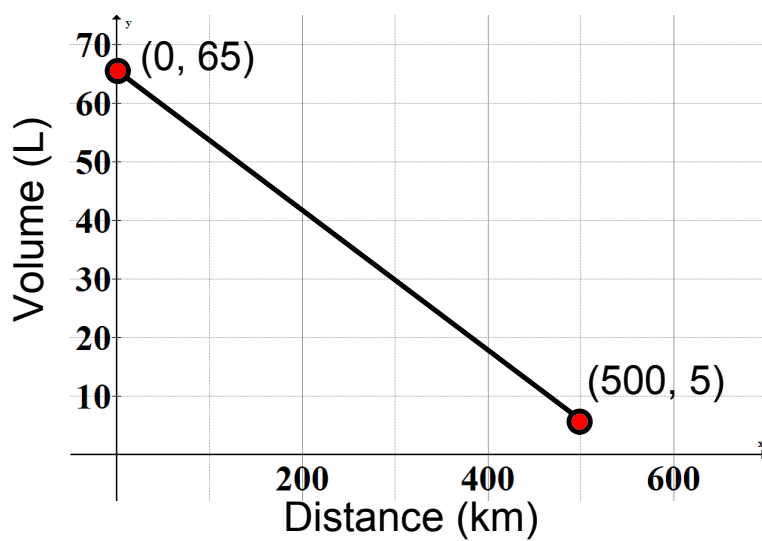
a) Calculate the slope of the graph.

$$\frac{\text{Rise}}{\text{Run}} = \frac{-60}{500} = -0.12 \text{ L/km}$$

b) Interpret the slope as a rate of change.

every 0.12 L will travel 1 km

Fuel Consumption



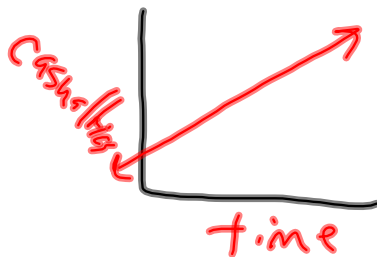
c) Determine a unit rate from the graph.

d) Determine another unit rate from the graph.

More Examples of Rates of Change?

Positive

Fire fighting:
Length of time &
casualties



Negative

mountain climbing:
elevation and
oxygen levels



- 12** Abigail buys a prepaid card for her cellphone. When she talks on her phone, a fee per minute is deducted from the value of the prepaid card.

The table below shows information about the remaining value of the card.

Total number of minutes used, t	Remaining value, V (\$)
10	22.00
20	19.00

a) $\frac{\$}{\text{min}} = \frac{\$3}{10 \text{ min}}$

b) $30 \frac{\$}{\text{min}}$

- What is the rate of change in this situation?
- What is the unit rate?
- Write an equation to model this situation.

Consolidation

Practice it!

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#1-7, 9