5.2 INTERPRETING GRAPHS

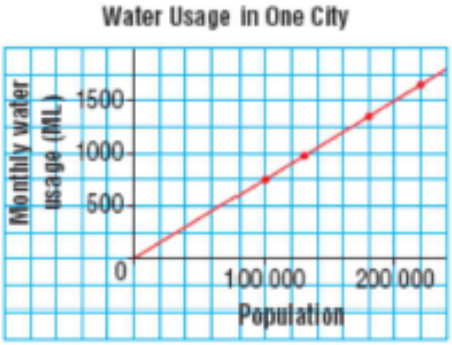
Name:_____ Block_____

A) Reading Graphs

Investigation:
Kelowna has grown in population over the past few years. This table and graph show how the volume of water used each month is related to the population.

Population	Monthly Water Usage (ML)
100 000	750
130 000	975
180 000	1350
220 000	1650

1 ML = 1 000 000 L
(ML → Megalitre)

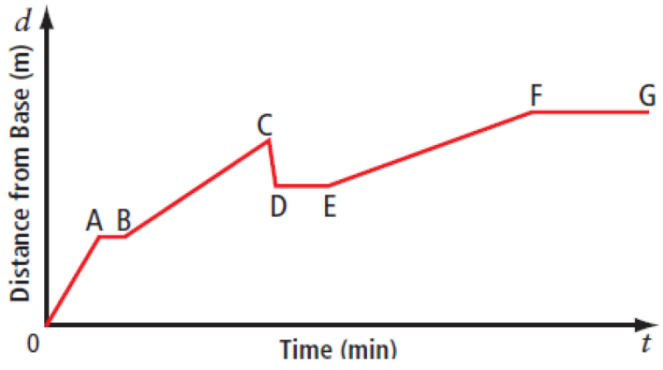


1. Estimate the monthly water usage for a population of 150 000 people.

2. Estimate the population when the monthly water usage is 1400 ML.

3. Predict the water usage for 250 000 people.

Example 1:
The graph below shows the distance a rock climber is from the base of the cliff as time passes.



a) Describe one property a line segment has if the climber is climbing.

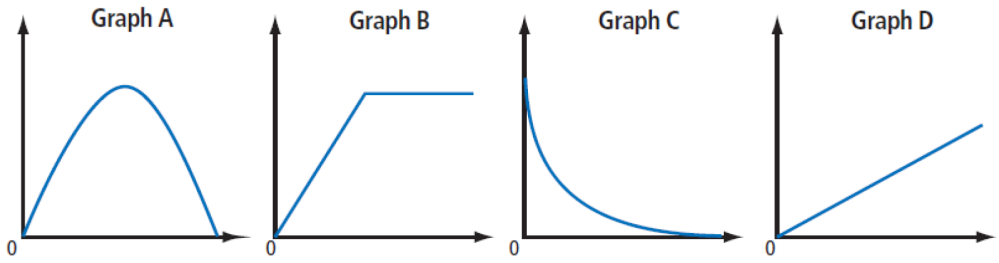
b) Describe one property a line segment has if the climber is resting.

c) Describe one property a line segment has if the climber is descending.

d) How would the graph of the line segment be different if he increased his speed for the first time he climbed?

f) What would you add to the graph to show the climbers return to the bottom of the cliff?

Example 2: Match each graph below with a situation from the list given.



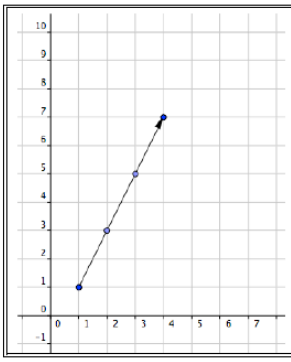
a) the temperature of a cup of hot chocolate over time

b) a car accelerating to a constant speed

c) the distance a person walks during a hike

d) the height of a soccer ball kicked across a field

B) Interpolation & Extrapolation



Interpolation: Estimate a value between two known values.

- i.e. If x=2.5 then y should equal 4 since x=2→y=3 and x=3→y=5
- (x=2.5 is between 2 and 3, as y=4 is between 3 and 5)

Extrapolation: Predict a value by extending a pattern beyond known values.

- If x=5 then y should equal 9 if the pattern continues.
- (The graph goes right one and up two units.)

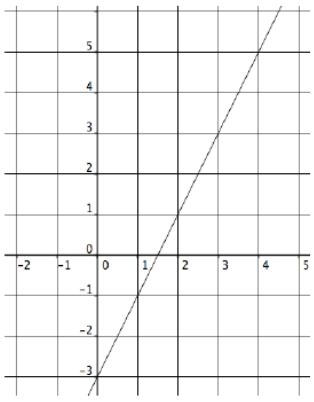
The process of predicting values that lie between given data points on the graph is called _____.

Determine the values by interpolation.

105.

A. Find y if x=1.

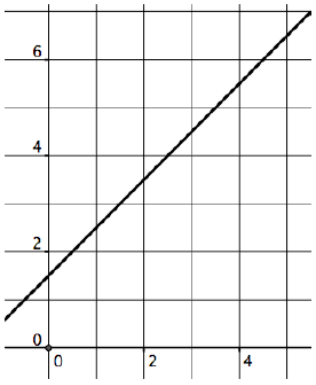
B. Find x if y=4.



106.

A. Find y if x=3.

B. Find x if y=0.



The process of predicting values that lie outside given data points on the graph is called _____.

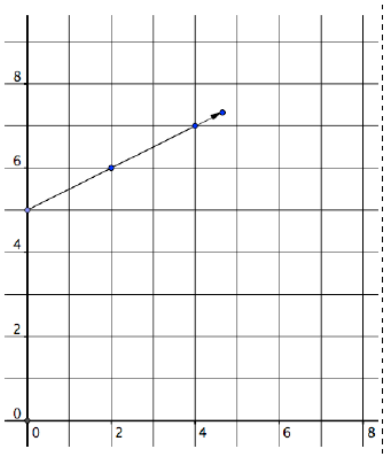
**** This procedure will require you to extend beyond the given graph ****

Determine the values by extrapolation.

109.

A. Find y if x=8.

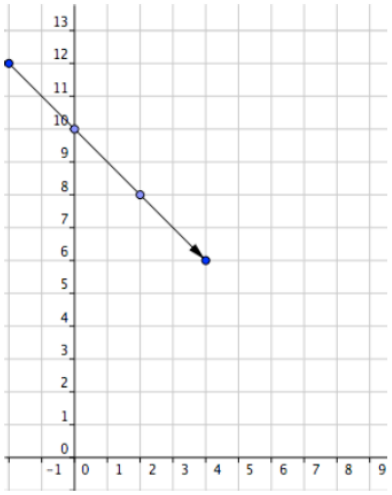
B. Find x if y=3.



110.

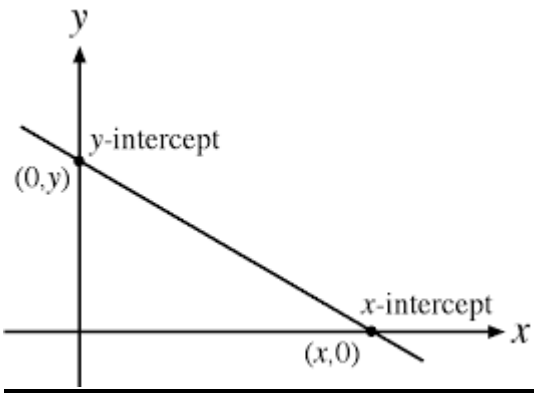
A. Find y if x=5.5.

B. Find x if y=1.5.



C) Intercepts & Linear Relations

Intercept _____



Linear Relation

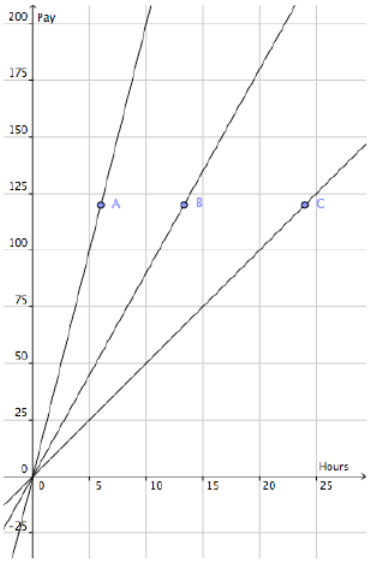
- A linear relation when graphed forms a straight line.
- Or a straight line can be drawn through every point of the graph.
- A linear relation has a constant rate of change.

What is a non-linear relationship?

PRACTICE

111. Business people are now hiring virtual assistants on the internet to do office tasks for them. Silvia needs a report turned into a power point presentation. She goes on line and receives three offers from 3 different virtual assistants.

The graph below represents three virtual assistants hourly rate.



A. Which letter represents the most expensive rate?

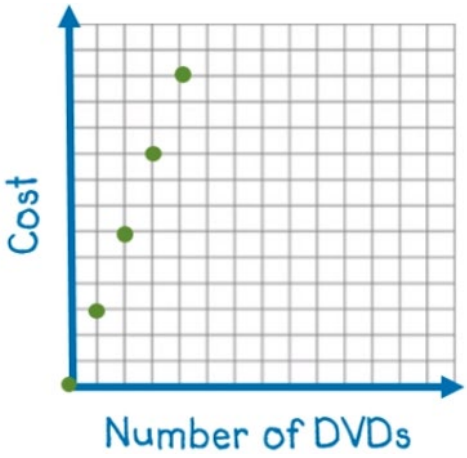
B. She thinks the job will take about ten hours. How much will she save by choosing company B over company A?

C. Write an equation to represent the approximate hourly rate for each company

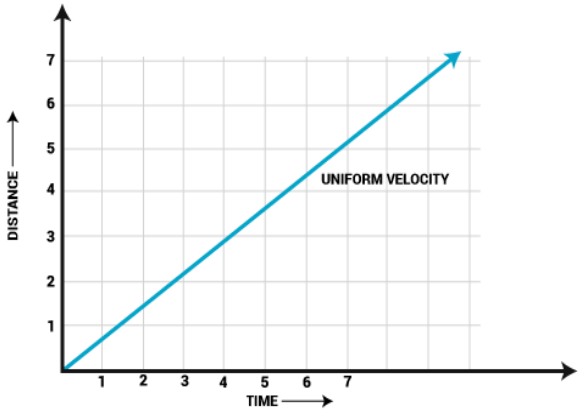
112. Did this challenge require interpolation or extrapolation?

D) Discrete & Continuous Relationships

Discrete

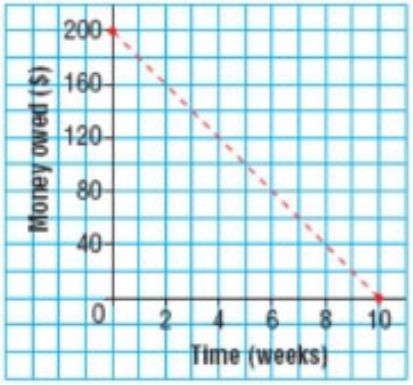


Continuous



Why would you not want to join the points on a graph of a discrete relationship?

Example #3: Vincent borrows money from his parents for a school trip to Science World. He repays the loan by making regular weekly payments. The graph shows how the money is repaid over time.



a) i.) How much did Vincent borrow initially?

ii.) What is another name for this point on a graph?

b) How much money does he owe after three weeks?

c) How many weeks will it take him to repay half of the money borrowed?

d) i.) How long does it take Vincent to repay the entire amount of the loan?

ii.) What is another name for this point on a graph?

e) Do questions a, b, and c use interpolation or extrapolation?

f) Why is extrapolation not relevant in this example?

g) Why is the line dotted rather than solid?

h) The independent variable is _____

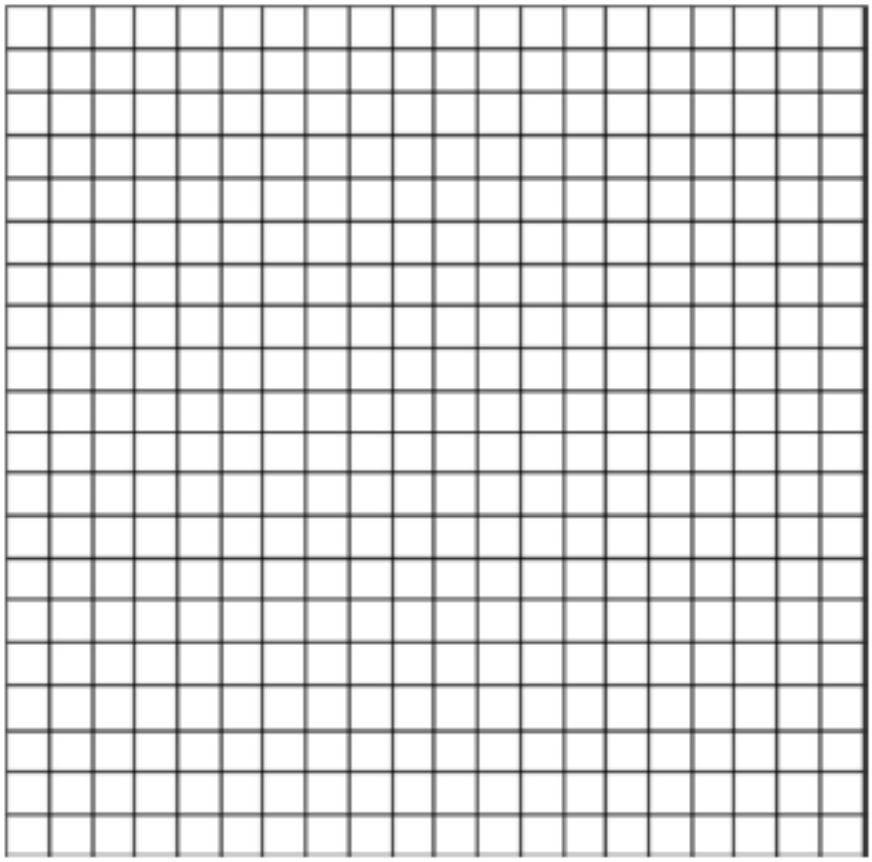
The dependent variable is _____

Example #4: Julia is jogging along the Galloping Goose Trail. Her trainer has made a chart of her progress below.

a) Using the table of values provided, graph the data below.

Before you graph, consider the following:title, independent variable, dependent variable, horizontal and vertical axes, scales of axes (includes all given data points and any point to be determined later through extrapolation), and discrete/continuous graph.

Time (min)	Distance (m)
0	0
2	240
5	600
9	1080
10	1200



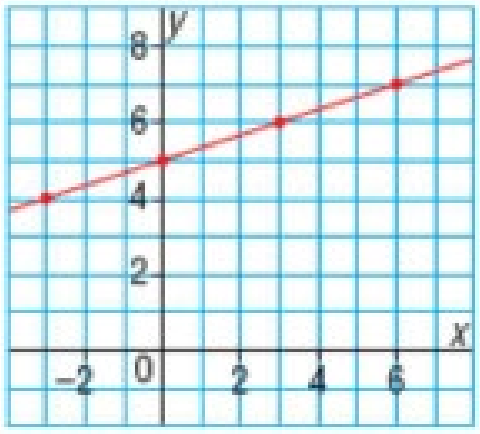
b) Determine how far Julia can jog in 7 minutes.

c) Predict how long it will take Julia to jog 1800 m.

d) Predict how far she can jog in 15 minutes.

e) What assumption did you make when answering the above questions?

Example #5: Use this graph of a linear relation.



a) Determine the value of *x* when *y* is 6.

b) Determine the value of *y* when *x* is -3.

c) Determine the value of *x* when *y* is 3.

d) Determine the value of *y* when *x* is 9.

e) Determine the value of *y* when *x* is 5.

Assignment #5.2 pg 173-177

Required	Extra Practice	Extension
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13	12, 14, 15, 16	17, 18, 19