Curriculum Outcomes:

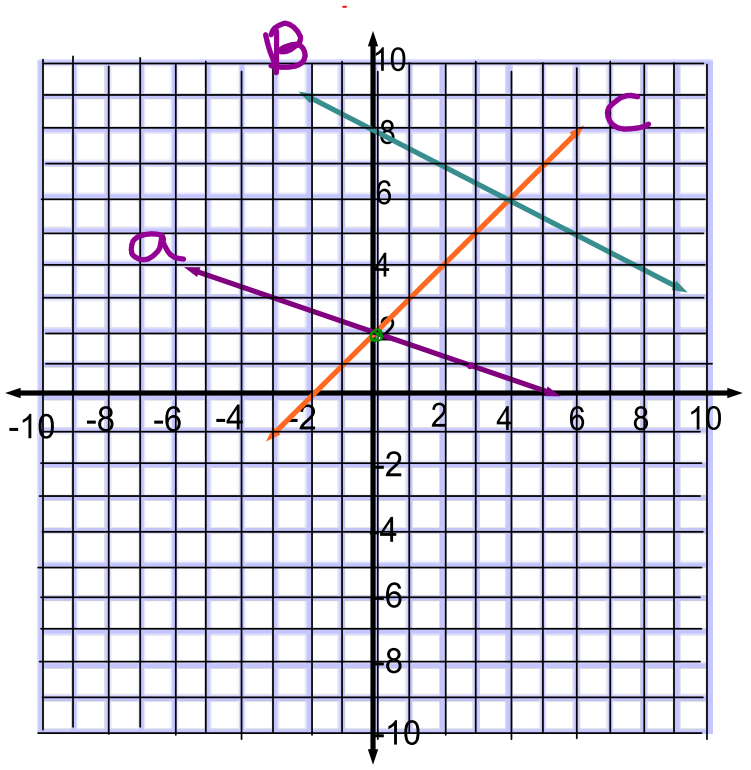
(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

(PR2) Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

Student Friendly: Being able to identify a linear pattern in a t-table.

Warm Up

1) Match the graph with the equation



a) $x + 3y = 6$

$3y = -x + 6$

$y = -\frac{1}{3}x + 2$

$\frac{\Delta y}{\Delta x} = \frac{-1}{3}$ (0, 2)

b) $y = \frac{-1}{2}x + 8$

$\frac{\Delta y}{\Delta x} = \frac{-1}{2}$ (0, 8)

c) $y - x = 2$

$y = x + 2$

$\frac{\Delta y}{\Delta x} = \frac{1}{1}$ (0, 2)

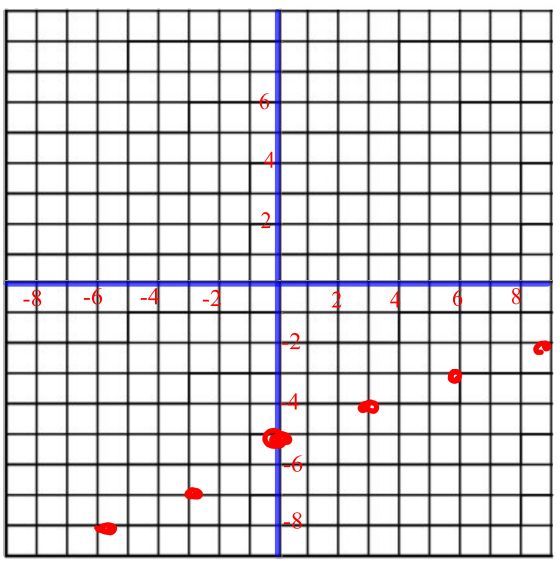
Warm Up

2) Sketch the graph for the following

b) $y = \frac{1}{3}x - 5$

$x = 0$
$y = -5$
$(0, -5)$

$\frac{\Delta y}{\Delta x} = \frac{1}{3}$



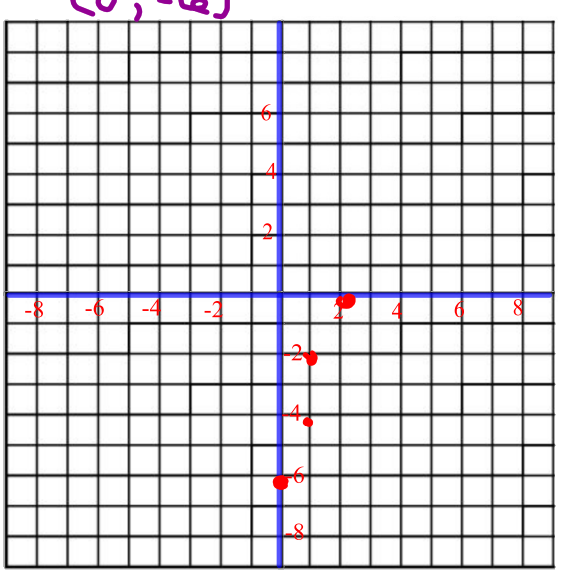
a) $2x - y = 6$

$-y = -2x + 6$

$y = 2x - 6$

$x = 0$
$y = -6$
$(0, -6)$

$\frac{\Delta y}{\Delta x} = \frac{2}{1}$



Warm Up

3) Amanda is hosting "After Formal" and her mom is ordering pizza. Each Pizza ordered will cost $15.00 plus an additional $ 4.00 for delivery. Write an equation that represents the cost of the pizza.

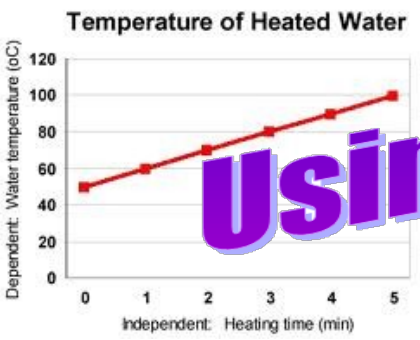
4) Determine if the following are linear or non-linear. If it is linear determine the equations.

a)

x	y
5	27
6	32
7	37

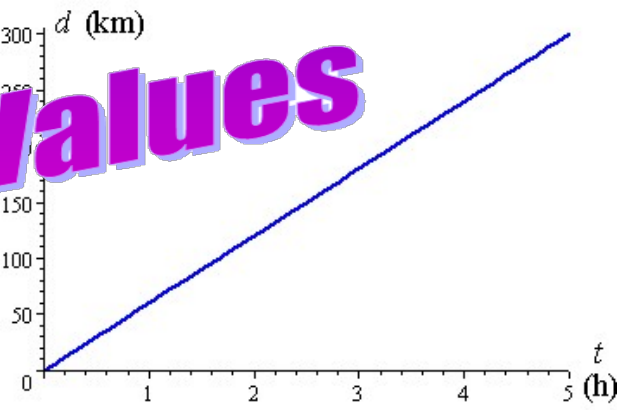
b)

t	d
1	12
2	9
3	6



Section 4.5

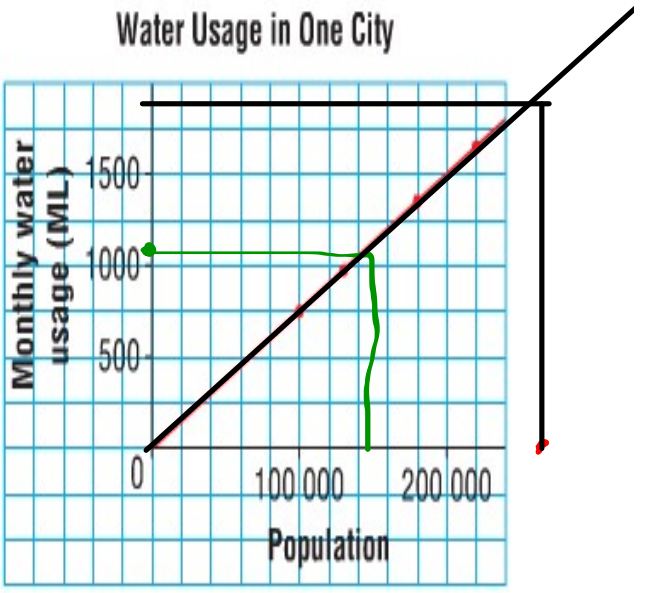
Using Graphs to Estimate Values



A city has grown 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
160 000	1 200
190 000	1 425

1 ML is 1 000 000 L.



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

b) Predict the water usage for 250 000 people.

$y = \frac{225}{30000}x$

$y = \frac{225}{30000}(150000)$

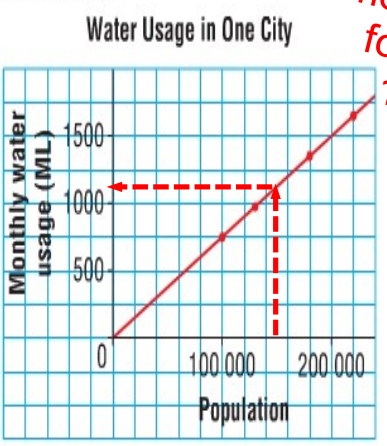
$y = 1125$

a)

A city has grown 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
150000	
160 000	1 200
190 000	1 425

1 ML is 1 000 000 L.



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

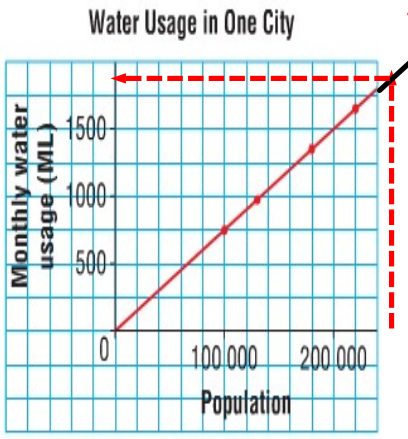
Interpolation... ***estimate values that lie between two data points***

b)

A city has grown 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
160 000	1 200
190 000	1 425

1 ML is 1 000 000 L.



Predict the water usage for 250 000 people.

Use a ruler to extend the line.

Extrapolation... ***estimate values that lie outside the given data points***

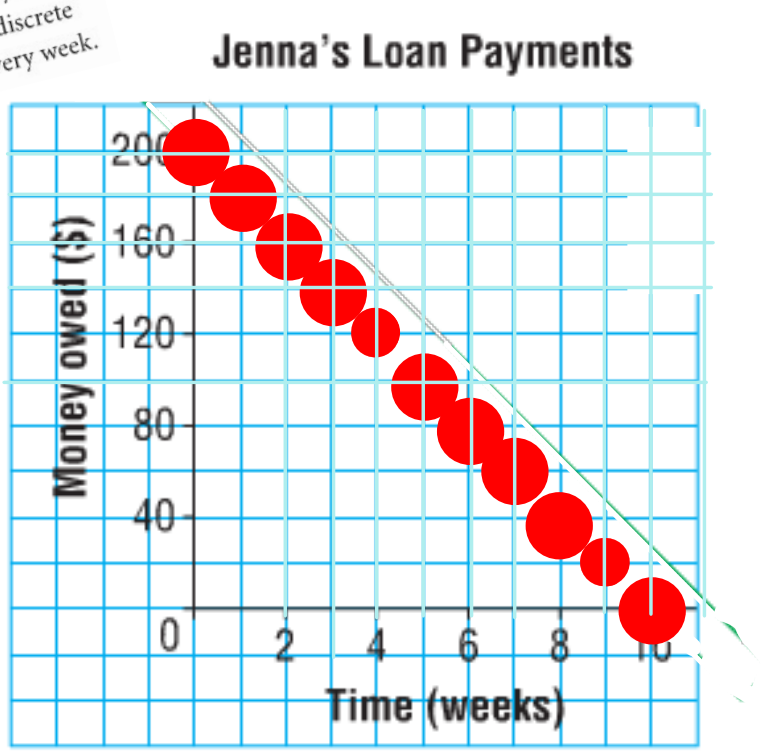
Population	Monthly Water Usage (ML)
100 000	750
130 000	975
160 000	1 200
190 000	1 425

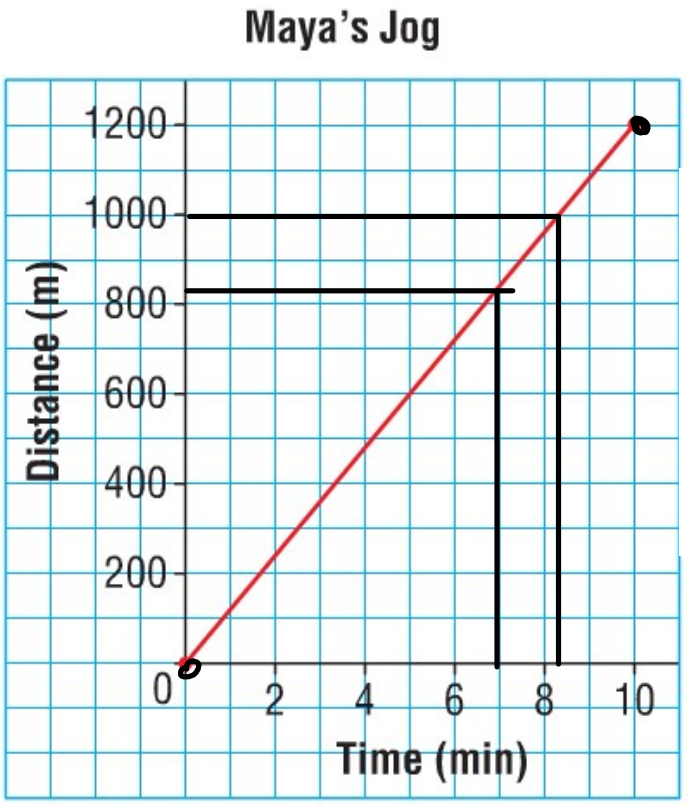
Jenna borrows money from her parents for a school trip. She repays the loan by making regular weekly payments. The graph shows how the money is repaid over time. The data are discrete because payments are made every week.

a) How much money did Jenna originally borrow?

b) How much money does she still owe after 3 weeks?

c) How many weeks will it take Jenna to repay one-half of the money she borrowed?





Use the graph.

١٦-١٩

a) Predict how long it will take Maya to jog 2000 m.

b) Predict how far Maya will jog in 14 min.

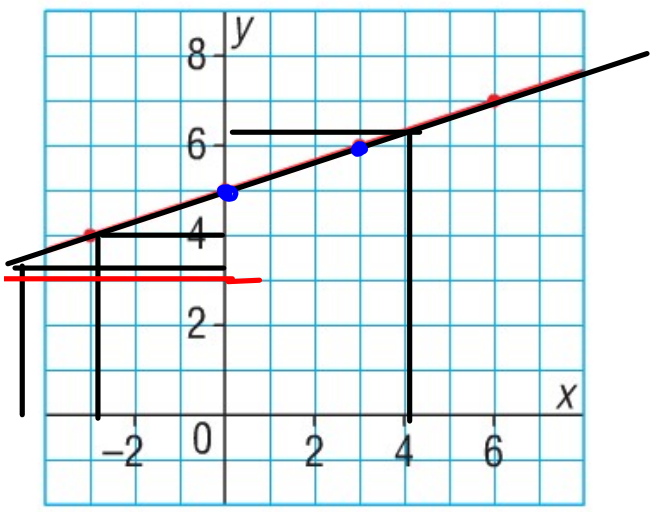
c) What assumption did you make?

t	d
0	0
10	1200

$d = \frac{1200}{10} t$

Which questions can be answered using interpolation?

Which questions will have to be answered using extrapolation?



Determine the values of y for each of the following values of x.

a) x = -3 y= 4

b) x =4 y=6

c) x = -4 x =

Determine the values of x for each of the following values of y.

a) y = 3 b) y = 7 c) y = 8

x= -6

x	y
-8	2
-6	3
-3	4
0	5
3	6
6	7
9	8
12	9

HOMEWORK

Page 196 - 197

4,5,7,9,~~11~~,

11,~~12,13,14~~,15