Curriculum Outcomes:

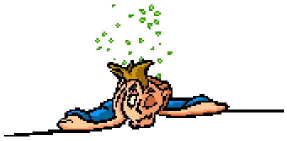
(PR1) Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution.

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

Student Friendly: Looking at a graph or t-table and determining if they are linear or non-linear or discrete or continuous

Warm Up

Day 2



Create a table of values for the equation: $y = 3x + 8$

$x = -2$
$y = 3x + 8$
$y = 3(-2) + 8$
$y = -6 + 8$
$y = 2$

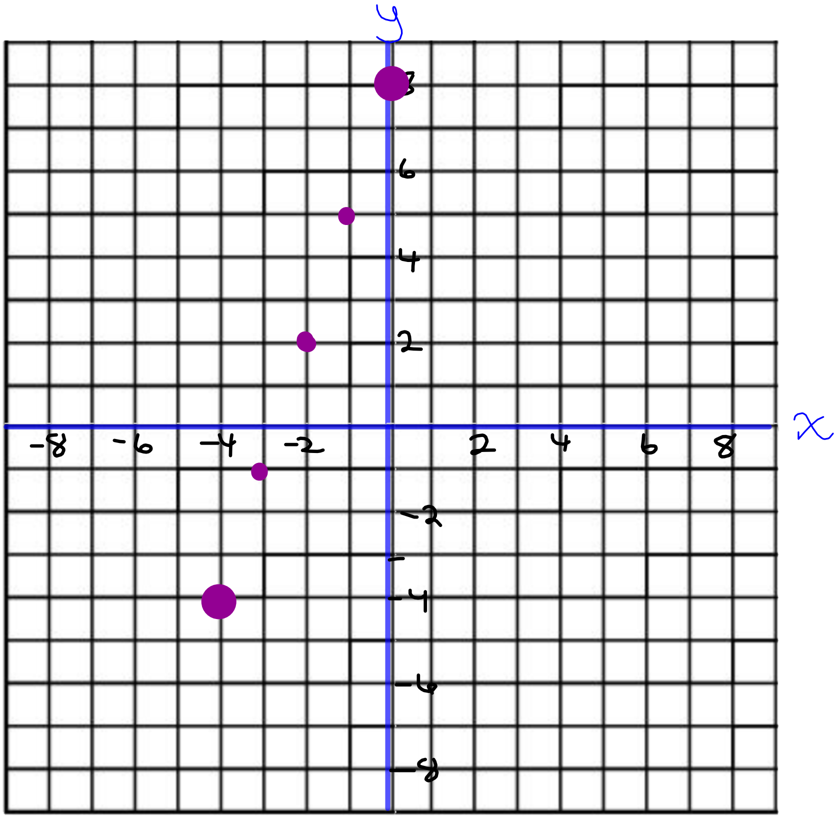
$x = -1$
$y = 3x + 8$
$y = 3(-1) + 8$
$y = -3 + 8$
$y = 5$

x	y
-2	2
-1	5
0	8
1	11
2	14

(x: +1 each step; y: +3 each step)

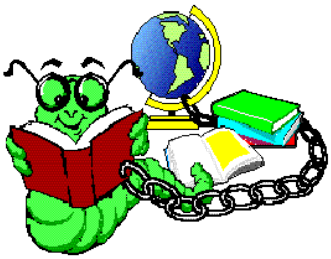
$$y = \frac{3}{1}x + 8$$

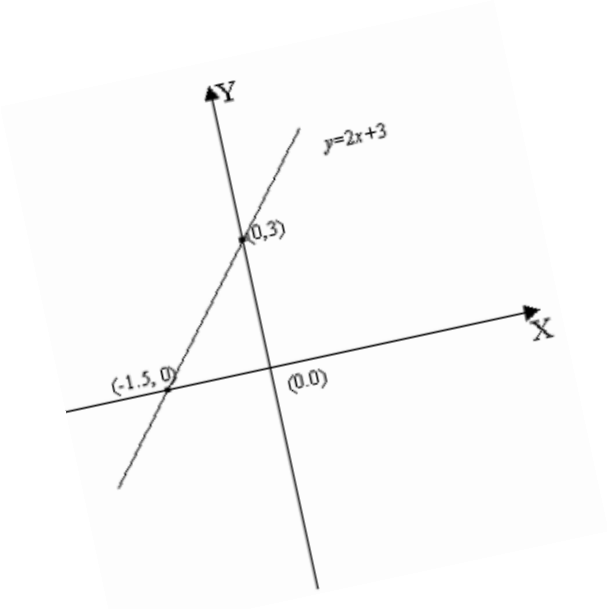
$$y = \frac{\Delta y}{\Delta x} x \pm \#$$

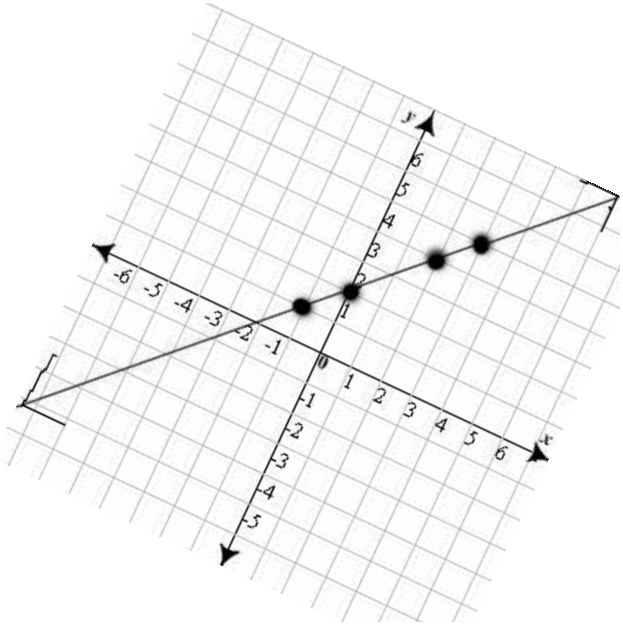


Section 4.2

Linear Relations



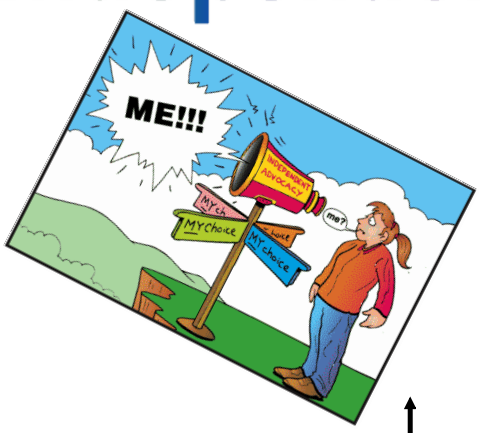




Dependent VS. Independent

$y = \frac{\Delta y}{\Delta x} x \pm \#$

If the equation is: $P = 2n + 4$



P is the dependent variable

n is the independent variable

Dependent variable is always plotted on vertical axis (y-axis) ↕

Independent variable is always plotted on the horizontal axis (x-axis) ↔

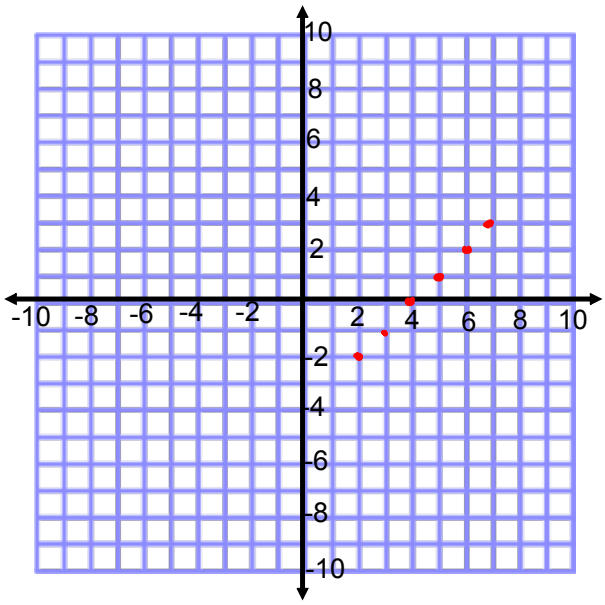
Linear Relation

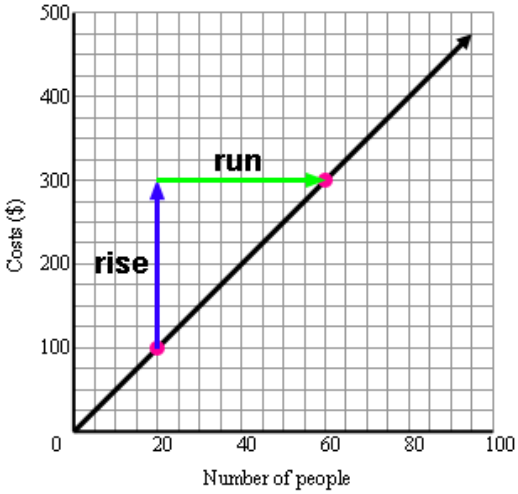
- is when the graph is a straight line
- a constant change in 'x' causes a constant change in 'y'

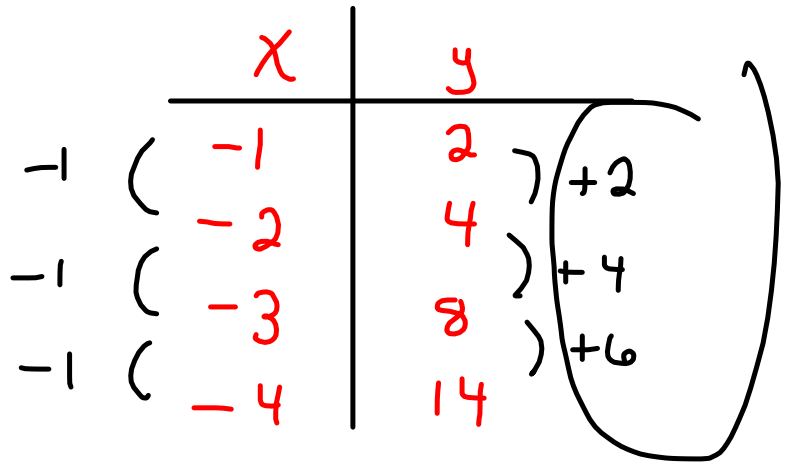
Table of Values

x	y
0	-6
1	-4
2	-2
3	0

+1 +2 +1 +2 +1 +2






x
y
-1
-1
-2
2
4
+2
-1
-3
8
+4
-1
-4
14
+6

Concrete vs. Discrete

Discrete : Dots

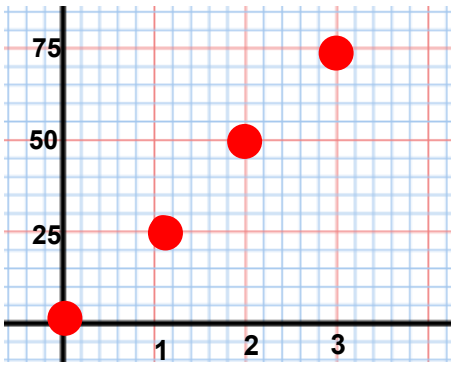
Continuous: Connect dots

Cost of video games

x Number of Video games	Cost, C($)
1	25
2	50
3	75

Can you buy 1.5 video games?

So would you connect the dots???

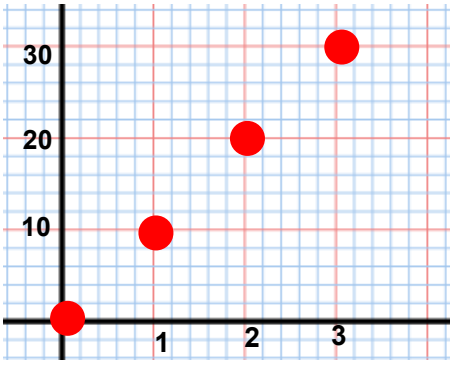


Babysitting Job

x Number of Hours	Earnings, C($)
1	10
2	20
3	30

Can you work 1.5 hours?

So would you connect the dots???

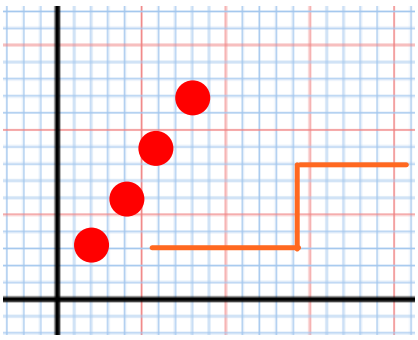


SECTION 4.2: LINEAR RELATIONS

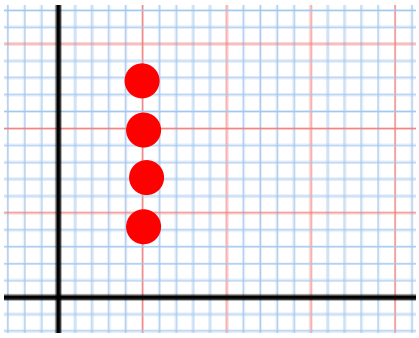
VOCABULARY:

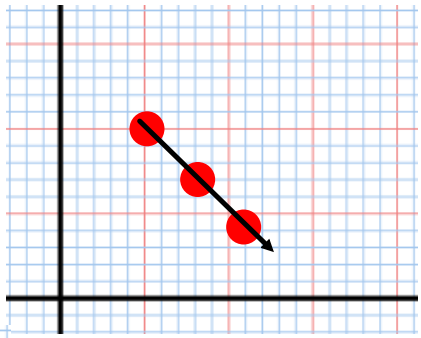
1. **DISCRETE DATA: Data that does NOT have an infinite number of values between whole numbers; in graphs containing discrete data, points are NOT joined together to signify this. (Think NO fractions and NO decimals.)**
   examples: number of people, number of squares

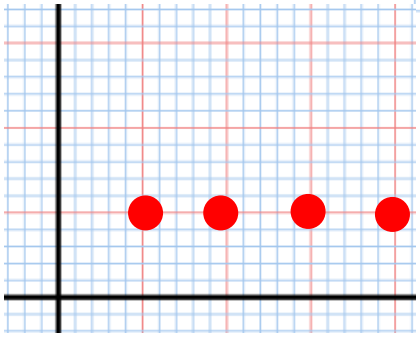
2. **CONTINUOUS DATA: Data that has an infinite number of values between whole numbers; in graphs containing continuous data, points are joined together to signify this. (Think fractions and decimals.)**
   examples: heights, distances, times, temperature, speed

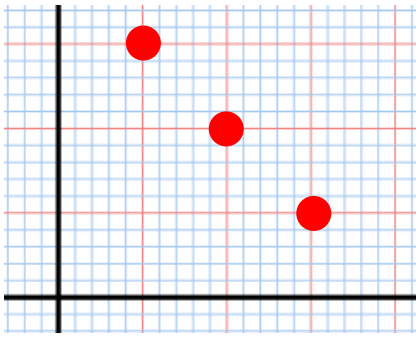


Discrete or Continuous??

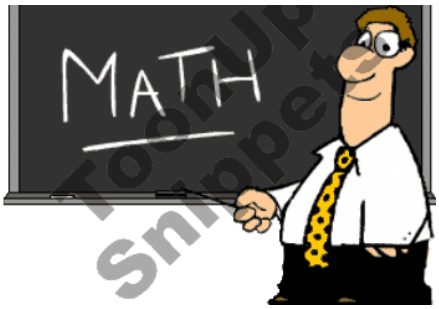








A relationship has the equation: $y = 7-2x$



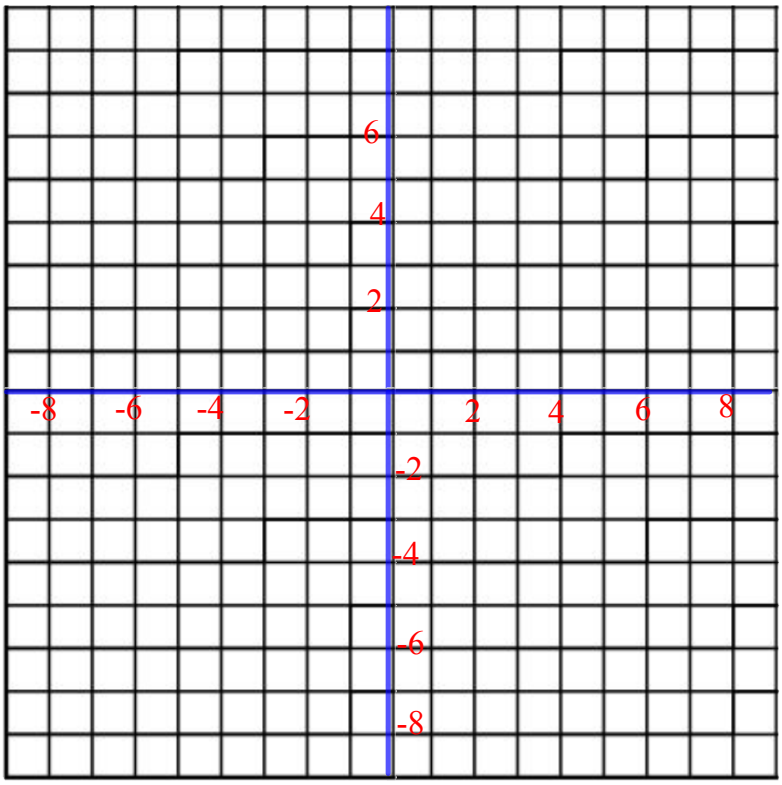
a) Create a table of values for the relation for values -2 to 2.

x	y
-2	
-1	
0	
1	
2	

We have to do some work!

for $x = -2$ for $x = -1$

$y =$ $y =$



Choose Numbers that are easy to work with

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

$y = \frac{\Delta y}{\Delta x} x \pm \#$

$\Delta x = 3$ $\Delta y = 2$

x	y	
-6	-3	+2
-3	-1	+2
0	1	+2
3	3	+2
6	5	

$x = 0$

$y = \frac{2}{3}(0) + 1$

$y = 0 + 1$

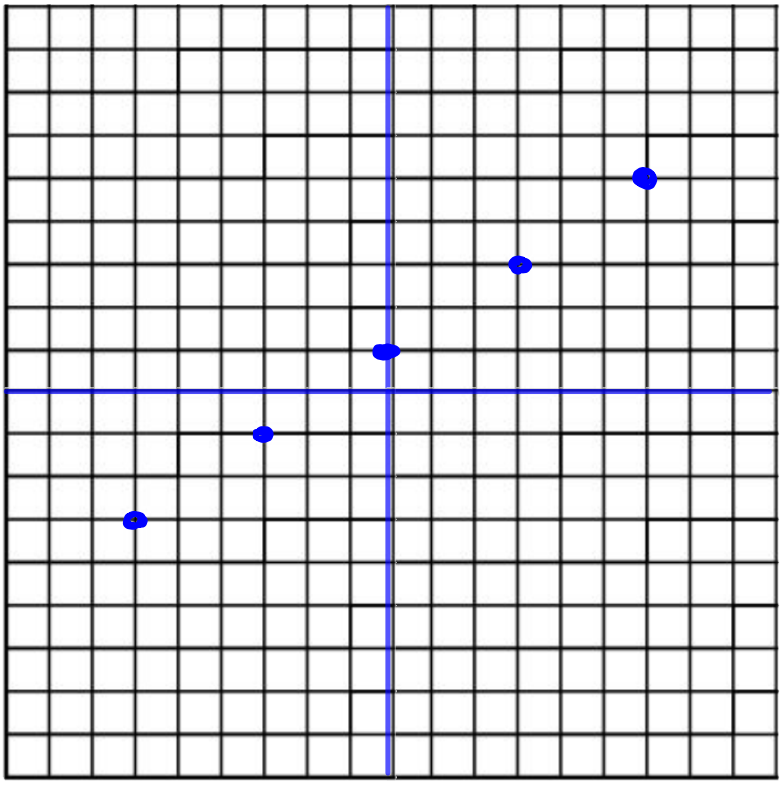
$y = 1$

$x = 3$

$y = \frac{2}{3}(3) + 1$

$y = 2 + 1$

$y = 3$



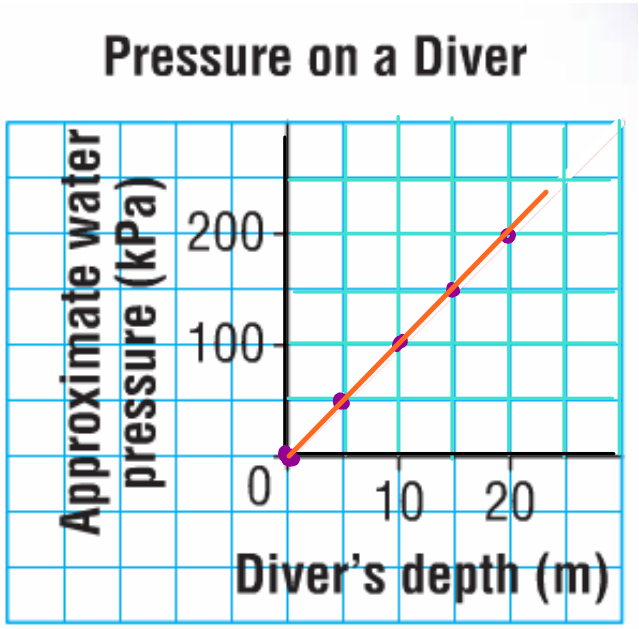
Example: Please turn to page 164 in *MMS9*.

When a scuba diver goes under water, the weight of the water exerts pressure on the diver.

x | y

Diver's Depth (m)	Approximate Water Pressure (kiloPascals)
0	0
5	50
10	100
15	150
20	200

(10) +5 +50 +5 +50 +5 +50 +5 +50



What pattern do you see in the table?

$y = \frac{\Delta y}{\Delta x} \times \pm\#$

$y = \frac{50}{5} \times \pm\#$

$y = 10x$

What pattern do you see in the graph?

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

$y = \frac{\Delta y}{\Delta x}x \pm \#$

$\Delta x = 2$ $\Delta y = 1$

x	y	
-4	1	$+1$
-2	2	$+1$
0	3	$+1$
2	4	$+1$
4	5	

$x = 0$

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

$y = \frac{1}{2}(0) + 3$

$y = 0 + 3$

$y = 3$

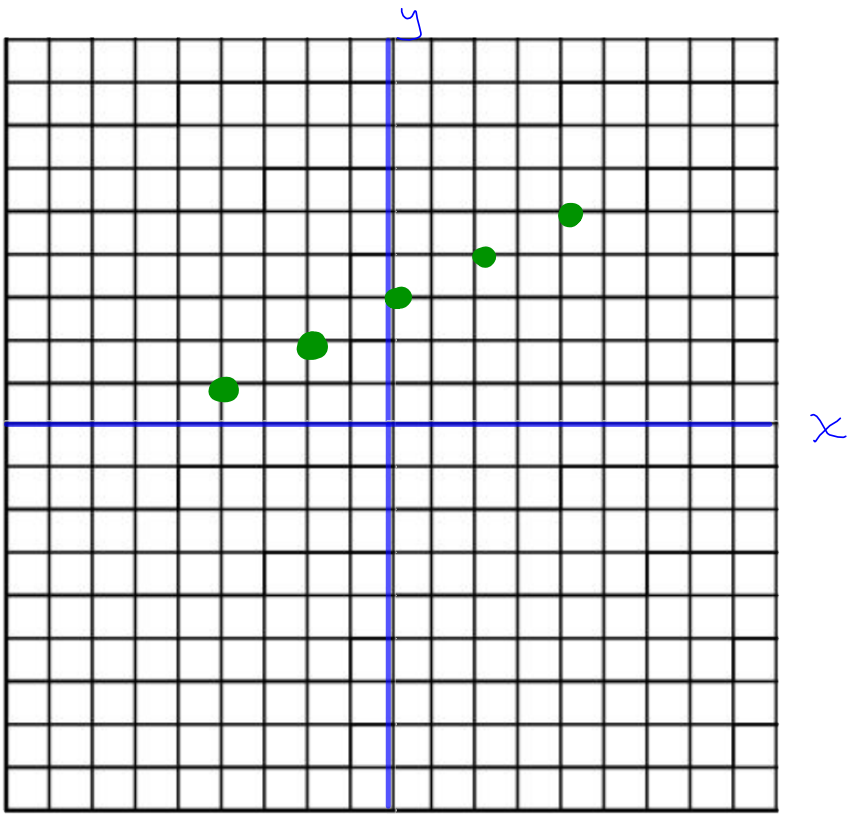
$x = 2$

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

$y = \frac{1}{2}(2) + 3$

$y = 1 + 3$

$y = 4$



5

A photographer charges a sitting fee of $10 and $5 for every photograph ordered.

goes with variable

Equation

1. How many photographs could you get for $35?

2. How much would it cost for 8 photographs?

7

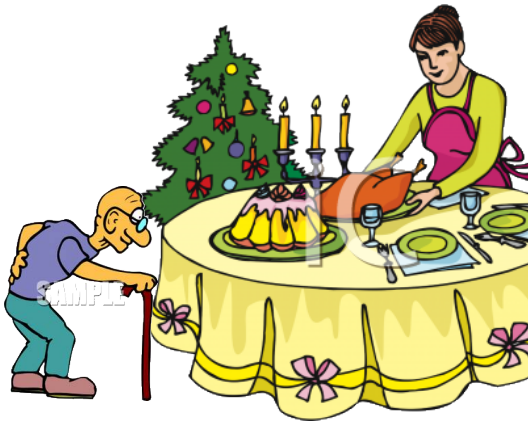
A taxi driver charges a flat fee of $25 and then $1 for every km travele

Equation

1. How far can you travel for $75?

2. How much would it cost to travel 50 km?

MVHS culinary students are planning to hold a Christmas supper for a local senior citizen home. The total profit is $9.00 a plate minus $125 for the entertainment.



Class/Homework

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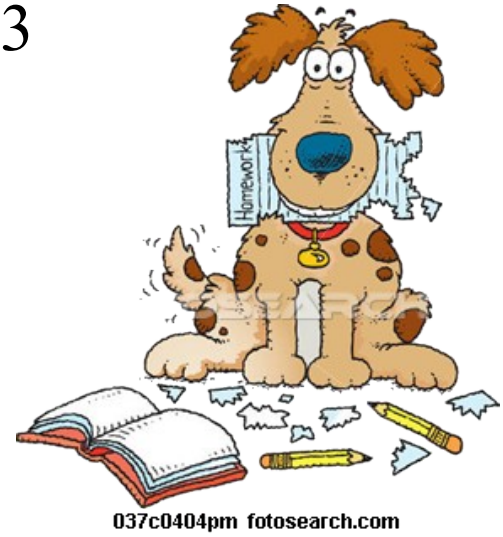

7 ad,
8 a-e

9 a,c

#10 a,c,e

#11,

14

#16