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: $y = 3x + 8$

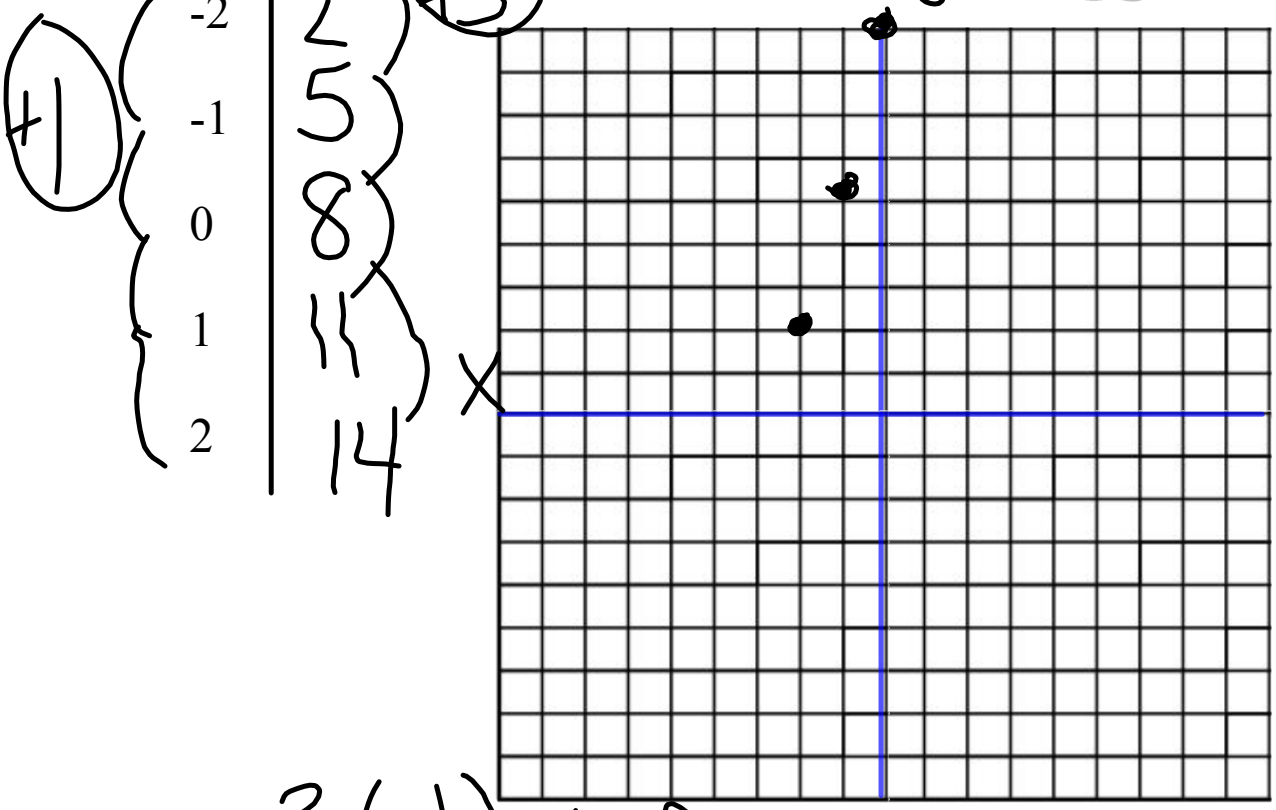
x	y
-2	2
-1	5
0	8
1	11
2	14

+3

+1

$y = 3(-2) + 8$

$-6 + 8$

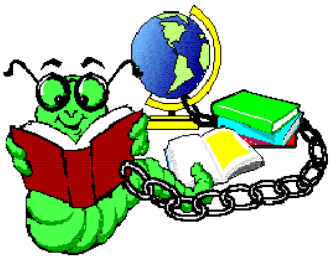


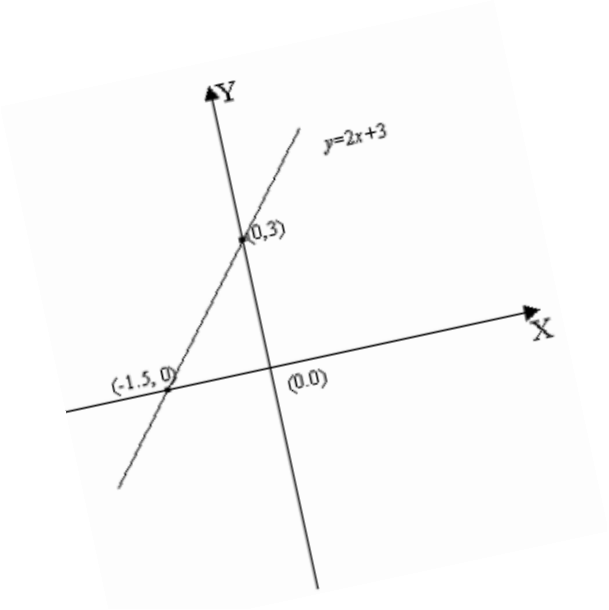
$y = 3(-1) + 8$

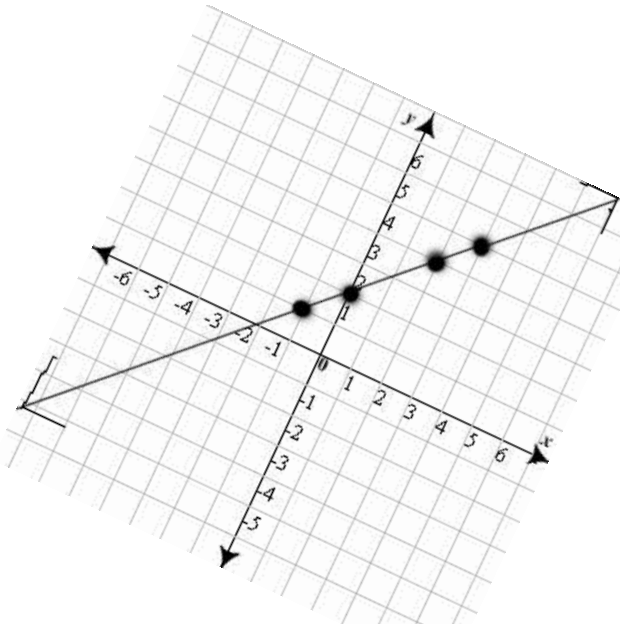
$-3 + 8$

5

Section 4.2
Linear Relations







Dependent VS. Independent

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

___ is the dependent variable

___ is the independent variable

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

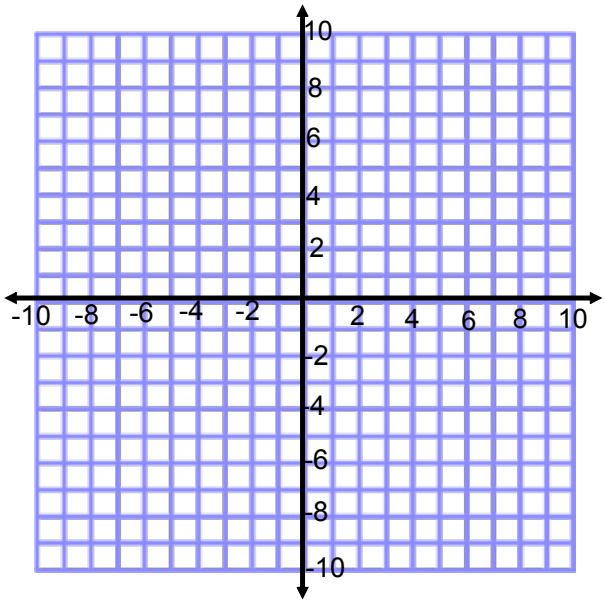
Independent variable is always plotted on the horizontal axis (x-axis) ↔

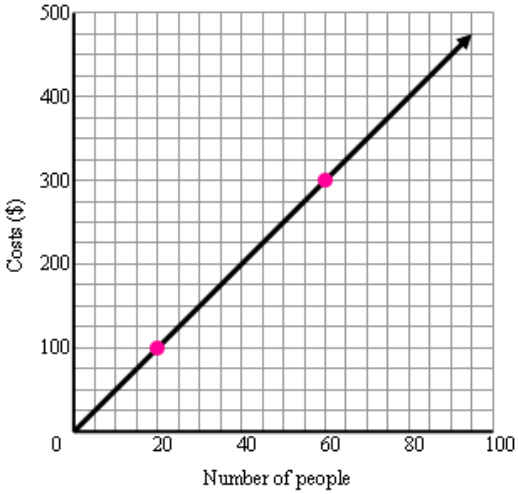
Linear Relation

- 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





Concrete vs. Discrete

Discrete : Unconnected

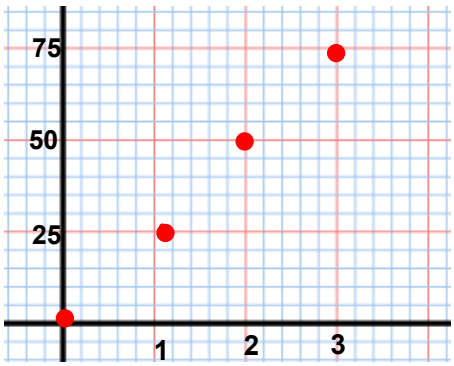
Continuous: Connected

Cost of video games

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???

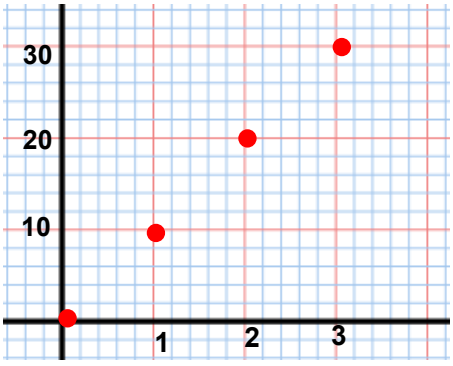


Babysitting Job

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

Can you work 1.5 hours?

So would you connect the dots???



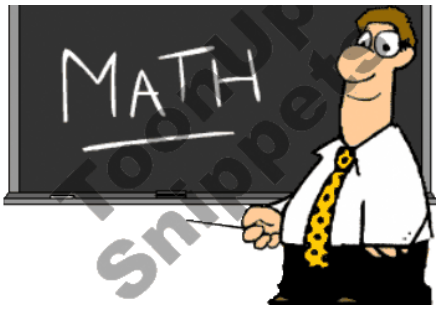
SECTION 4.2: LINEAR RELATIONS

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

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



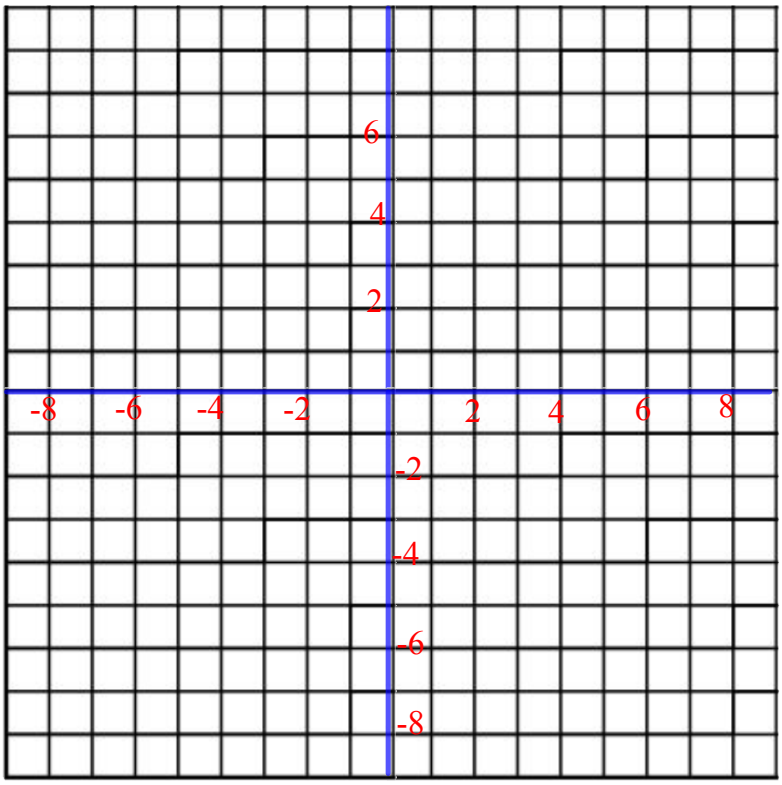
a) Create a table of values for the relation for values -2 to 2.

x	y
-2	
-1	
0	
1	
2	

We have to do some work!

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

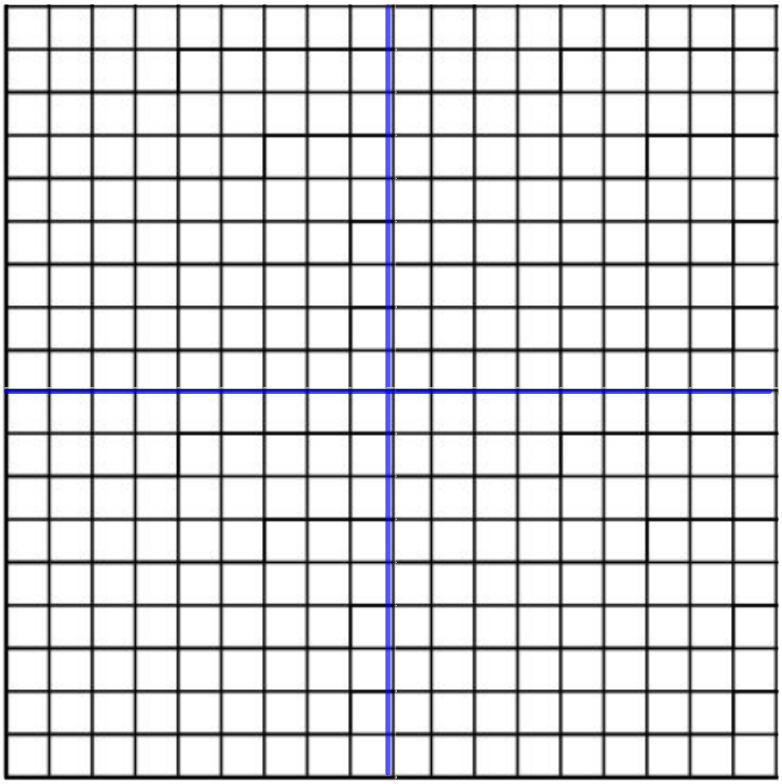
$y =$ $y =$



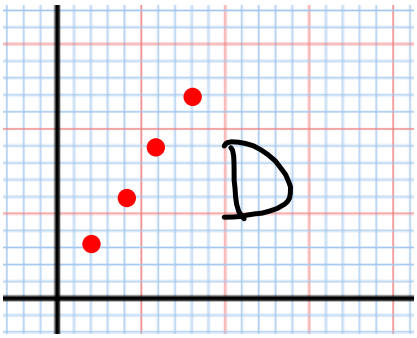
Choose Numbers that are easy to work with

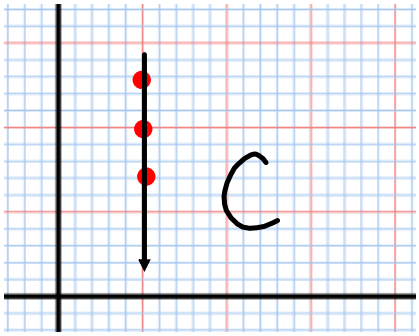
$$y = \frac{2}{3}x + 1$$

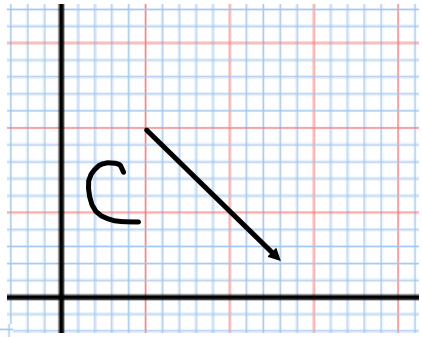
x	y

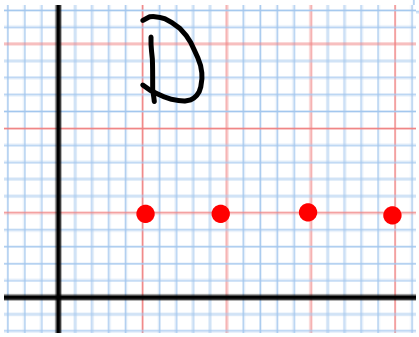


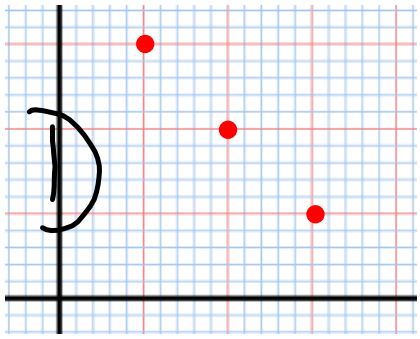
Discrete
or
Continuous??









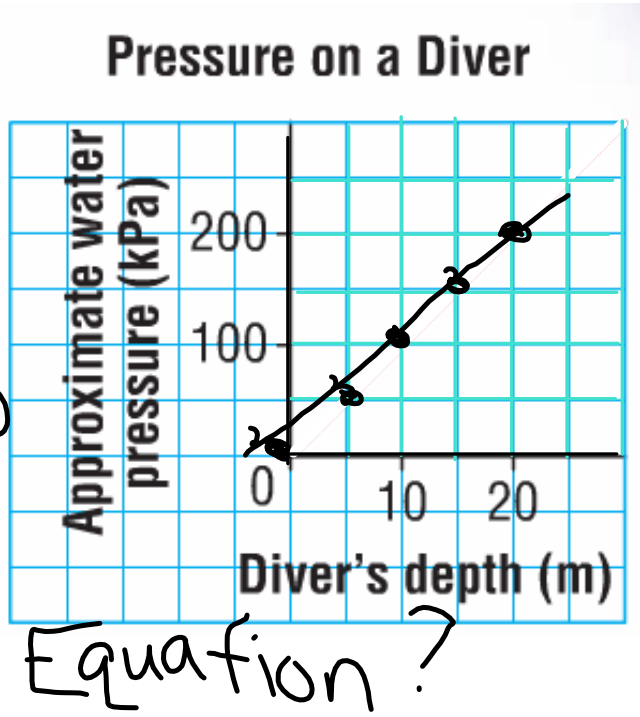


Example: Please turn to page 164 in *MMS9*.

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

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

+5 +50



Equation?

What pattern do you see in the table?

$y = 10x$

What pattern do you see in the graph?

linear, continuous

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

x	y
−2	2
0	3
2	4
4	5

+1, +2

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

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

$1 + 3$

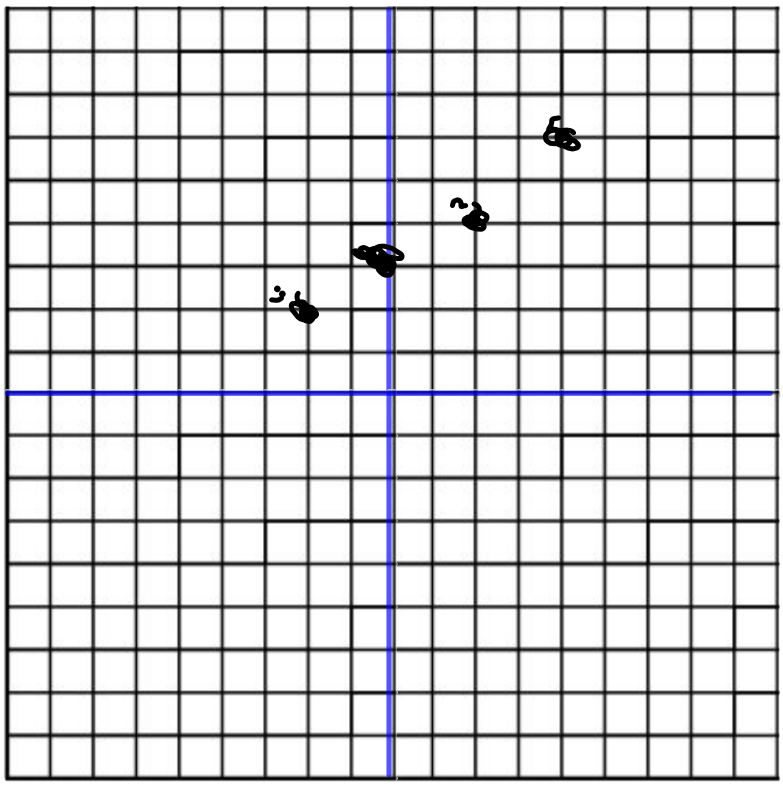
4

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

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

$y = -1 + 3$

2



5

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

Equation

x	y
0	10
1	15
2	20

+5 +5

$y = 5x + 10$

$C = 5p + 10$

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

$35 = 5p + 10$

$\frac{25}{5} = \frac{5p}{5}$ $p = 5$

2. How much would it cost for 8 photographs?

$C = 5(8) + 10$

$40 + 10$

$C = 50$

7

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

Equation

$y = 1x + 25$ (constant; changes)

$C = 1d + 25$

1. How far can you travel for $75?

$75 = 1d + 25$

$50 = 1d$

$d = 50\text{ km}$

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

$C = 1(75) + 25$

$75 + 25$

$C = \$100$

Class/Homework

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7 ad,
8

9 a,c

#10 a,c,e

#11,

14

#16