# 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

Feb 6-7:53 AM

Warm Up

T- Tables

x	y
-3	-4
0	1
3	6
6	11
9	16
12	21
15	26
.	.
.	.
.	.
300	501

$+3$ ($\frac{5}{3}$) $+5$
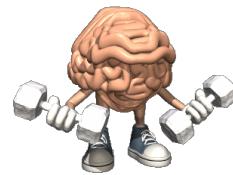
Write an equations

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

$$\boxed{y = \frac{5}{3} x + 1}$$

Write an expression for the relationship

$$\frac{5}{3} x + 1$$

Determine the value of "y" when x = 300

$$y = \frac{5}{3} x + 1$$

$$y = \frac{5}{3}(300) + 1$$

$$y = 500 + 1$$

$$y = 501$$

Mar 9-4:43 PM

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Section 4.2
Linear Relations

Oct 18-9:40 PM
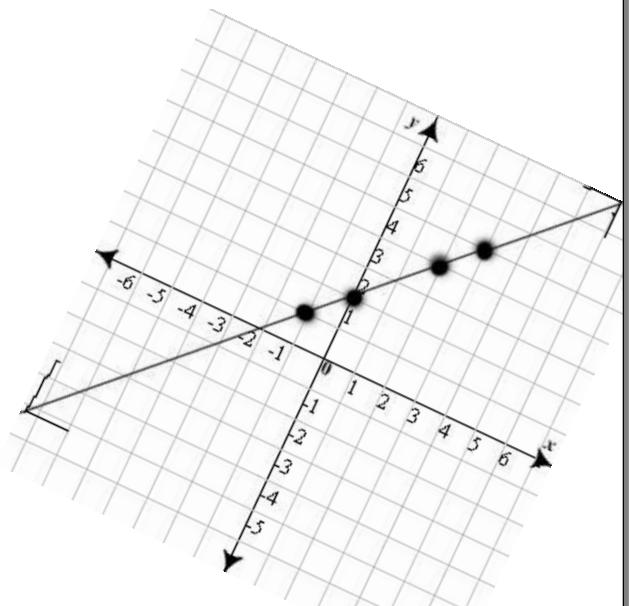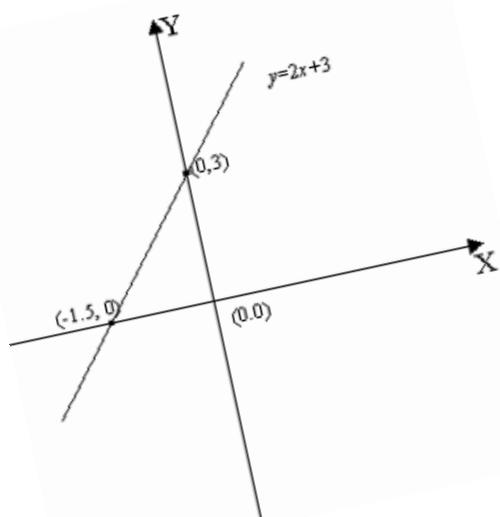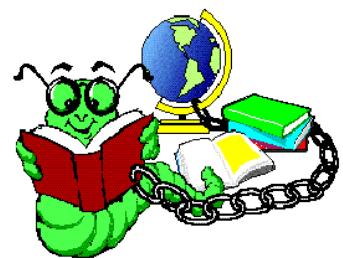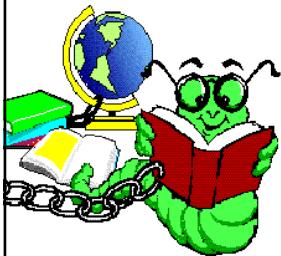
Remember ME

Let's look at it again.
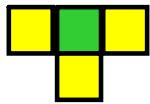
Figure 1   Figure 2   Figure 3
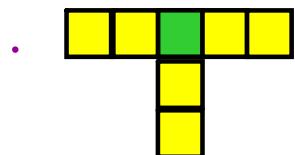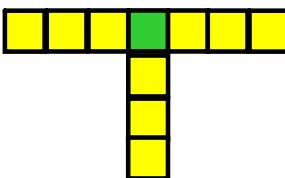
f Figure #	B # of Blocks
1 ×3	4)+3
2 ×3	7)+3
3 ×3	10)+3
4	13)+3
5	16)+3
6	19

T- Pattern Chart
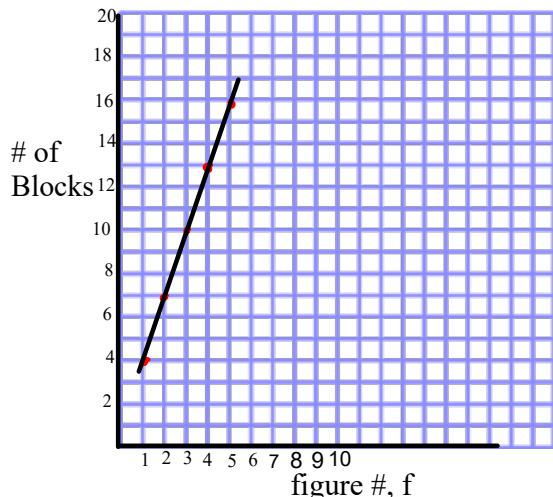
# of Blocks

figure #, f

$$B = \frac{3f + 1}{1}$$

THUS

For figure f, the number of blocks will be 3f +1
If n is the number of blocks then the equation is: $n = 3f + 1$

What changes the value of n??? (f)

So the value of __n__ depends on the value of __f__.

$$y = \# x \pm \#$$

↑ dependent

↗ Independent

$$y = 5x + 7$$

$$y = 5(2) + 7$$

$$y = 10 + 7$$

$$y = 17$$

Dependent VS. Independent

$y = 2x + 4$

*If the* _equation_ *is:* $P = 2n + 4$

P is the dependent variable

n is the independent variable
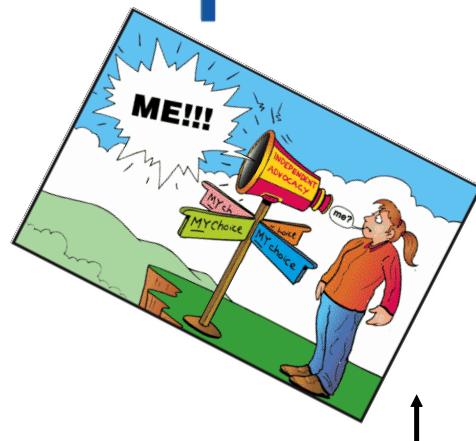
$y \rightarrow$ Dependent variable is always plotted on vertical axis (y-axis)

$x \rightarrow$ Independent variable is always plotted on the horizontal axis (x-axis)

ME!!!

Oct 7-11:54 PM

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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

- In a table if the x values change by a constant , and the y values change by a constant then the graph is linear

- If a graph makes a straight line when the points are connected then the graph is linear
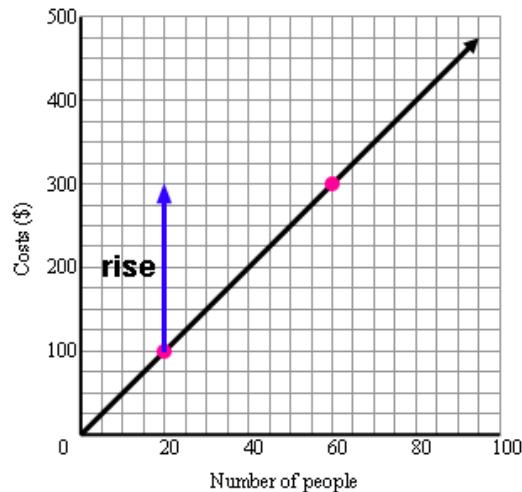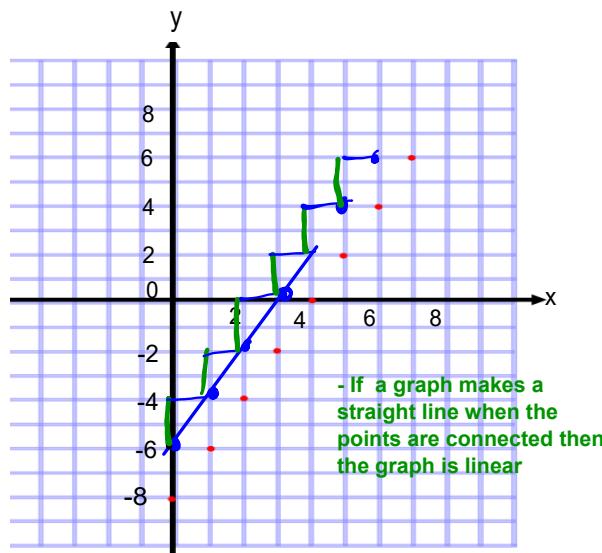
Concrete vs. Discrete

Discrete : ___Dots___

Continuous : ___Connect___

Think about the two situations

Cost of video games

| Independent X Number of Video games	Dependent y Cost, C($)
1	25
1.5	
2	50
3	75
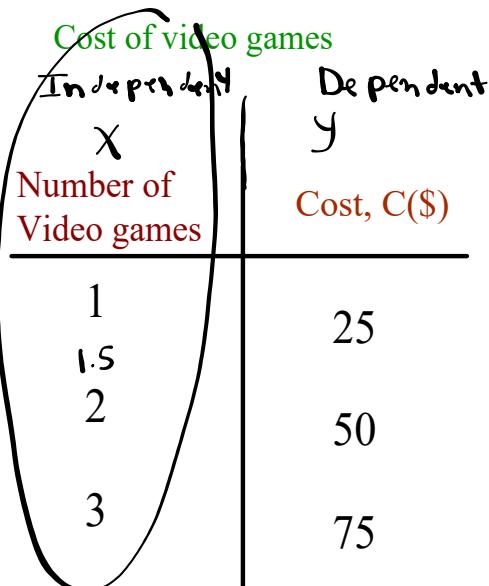
Can you buy 1.5 video games?

So would you connect the dots???

No

Discrete .

Babysitting Job

| X Number of Hours	y Earnings, C($)
1	10
1.5	→ 15
2	20
2.5	→ 25
3	30
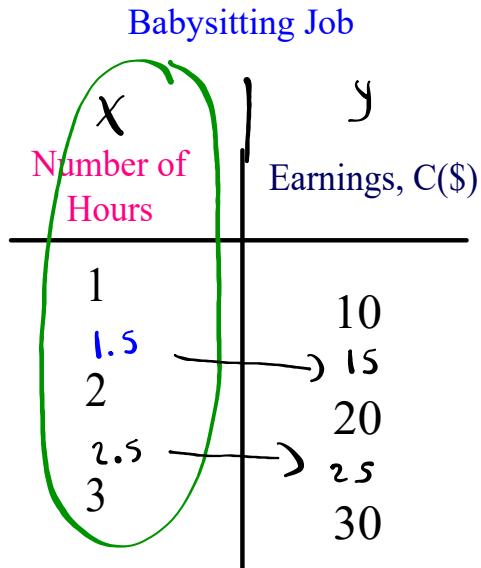
Can you work 1.5 hours?

So would you connect the dots???

Continuous
→ connected

Nov 9-8:09 PM

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.

$\Delta x = 5$ X   Y $\Delta y = 50$

Pressure on a Diver

Diver's Depth (m)	Approximate Water Pressure (kiloPascals)
0 (10)	0) 50
+5 (5 (10)	50) 50
+5 (10 (10)	100) 50
+5 (15	150) 50
+5 (20	200
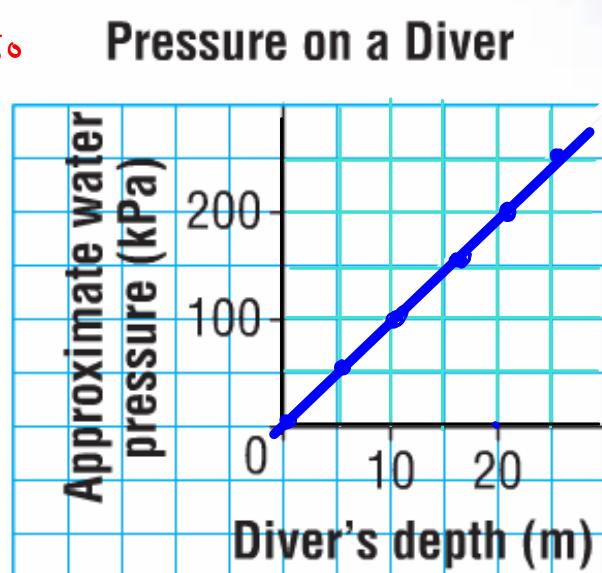
What pattern do you see in the table?

$\mathcal{L}inear$ $\Delta x = 5$ $\Delta y = 50$

What pattern do you see in the graph?

$$y = \frac{\Delta y}{\Delta x} \, x \, \pm \, H$$

$$y = \frac{50}{5} \, x \, \pm \, H$$

$$y = 10\,(x) + 0$$

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

$y = \frac{\Delta y}{\Delta x} x \pm b$
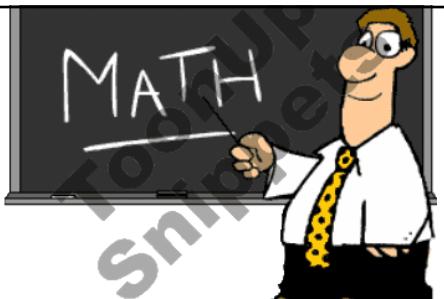
a) Create a table of values for the relation for values -2 to 2.

x	y
-2	11
-1	9
0	7
1	5
2	3

$+1\Big($ $\Big)-2$
$+1\Big($ $\Big)-2$
$+1\Big($ $\Big)-2$
$+1\Big($ $\Big)-2$

We have to do some work!

$x = -2$
$y = -2(x) + 7$
$y = -2(-2) + 7$
$y = 4 + 7$
$y = 11$

$x = -1$
$y = -2(x) + 7$
$y = -2(-1) + 7$
$y = 2 + 7$
$y = 9$

$x = 0$
$y = -2(x) + 7$
$y = -2(0) + 7$
$y = 0 + 7$
$y = 7$

Nov 9-8:06 PM

Choose Numbers that are easy to work with

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

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

$\Delta x = 3$

x	y
-3	-1
0	1
3	3
6	5
9	7

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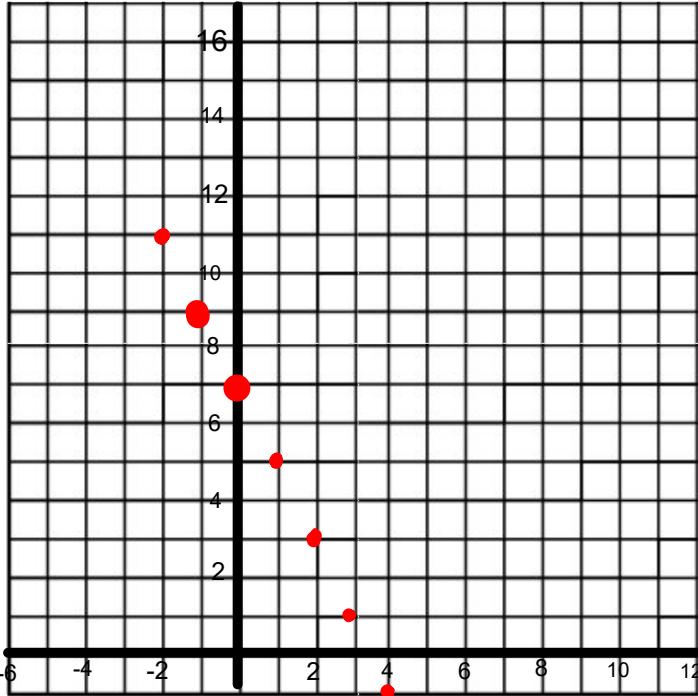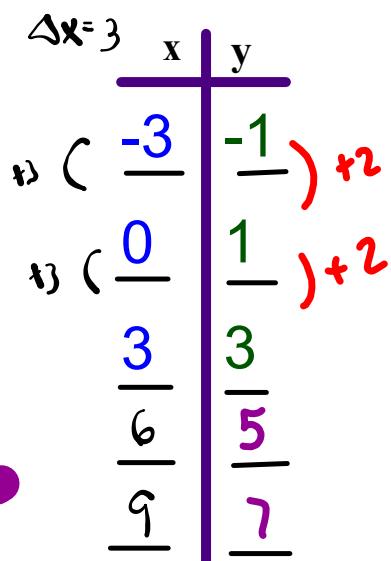
x= -3	x= 0	x= 3
$y = \frac{2}{3} x + 1$	$y = \frac{2}{3} x + 1$	$y = \frac{2}{3} x + 1$
$y = \frac{2}{3} (-3) + 1$	$y = \frac{2}{3} (0) + 1$	$y = \frac{2}{3} (3) + 1$
$y = -2 + 1$	$y = 0 + 1$	$y = 2 + 1$
$y = -1$	$y = 1$	$y = 3$

Choose Numbers that are easy to work with

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

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

$\Delta x = 2$　　　$\Delta y = 1$

| x	y
-2	2
0	3
2	4
4	5
6	6
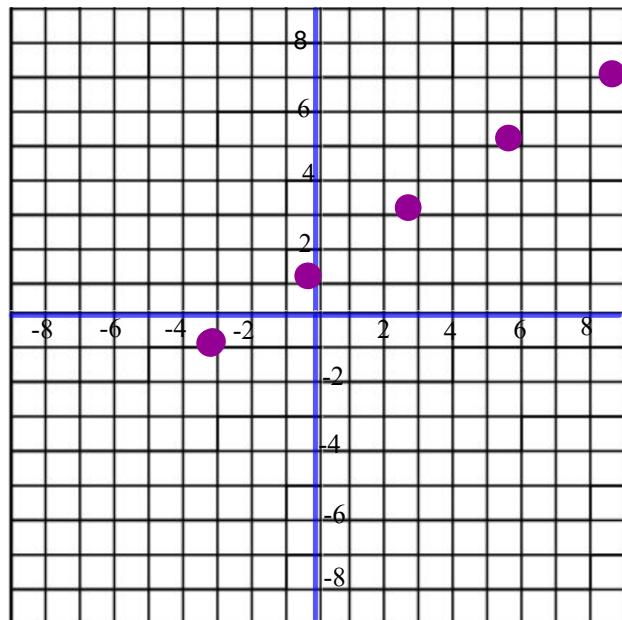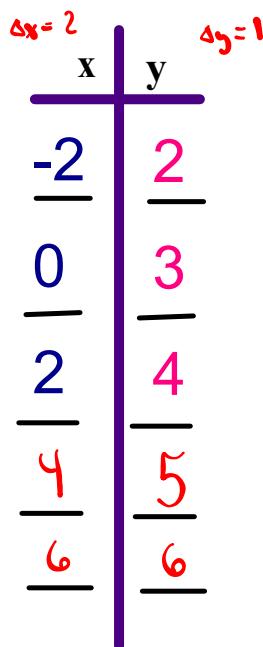
| x= -2	x= 0	x= 2
$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$	$y = \frac{1}{2}x + 3$
$y = \frac{1}{2}(-2) + 3$	$y = \frac{1}{2}(0) + 3$	$y = \frac{1}{2}(2) + 3$
$y = -1 + 3$	$y = 0 + 3$	$y = 1 + 3$
$y = 2$	$y = 3$	$y = 4$

$$y = -\frac{2}{5}x - 3$$

x	y
-5	-1
0	-3
5	-5

x= -5

$y = -\frac{2}{5}x - 3$

$y = -\frac{2}{5}(-5) - 3$

$y = 2 - 3$

$y = -1$

x= 0

$y = -\frac{2}{5}x - 3$

$y = -\frac{2}{5}(0) - 3$

$y = 0 - 3$

$y = -3$

x= 5
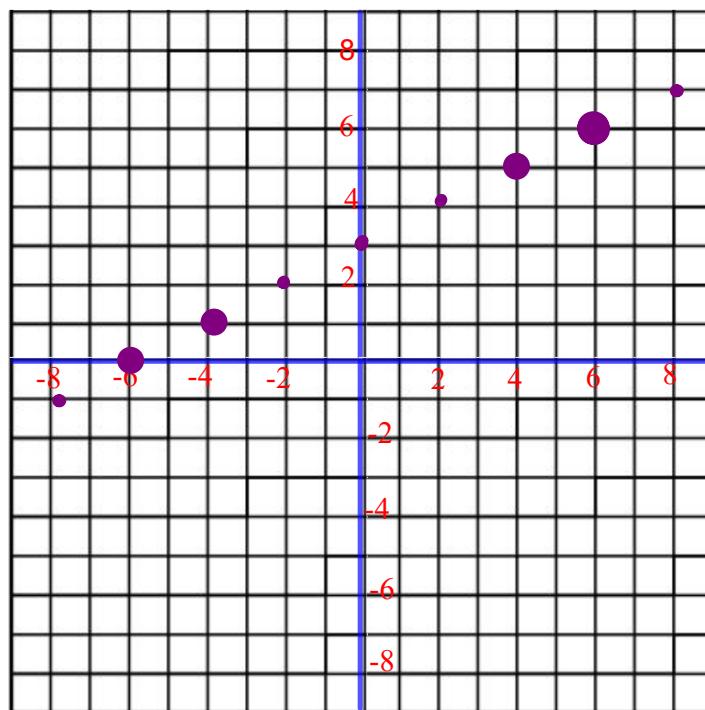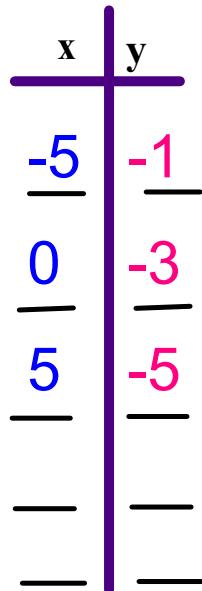
$y = -\frac{2}{5}x - 3$

$y = -\frac{2}{5}(5) - 3$

$y = -2 - 3$

$y = -5$

Now it is time for Home Learning
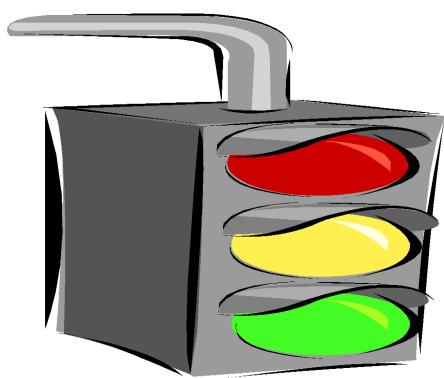
Class/Homework

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QUESTIONS

#4,   #11,

#5

7 ad,   # 14

8 a-e

9 a,c   #16

#10 a,c,e

Oct 27-10:41 PM