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

Grade 9 Warm Up

A local company offers a cell phone plan that has a fixed cost per month and a cost related to the number of text messages sent. The fixed cost is $20 and each message sent cost 15 cents.

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

$C = \underline{0.15}\, t + 20$

t	C
0	20
1	20.15
2	20.30
3	20.45

+1 (0.15) +0.15

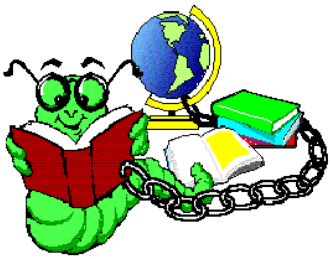
i) Write an equation that relates the total cost, C, to the number of text messages sent, t.

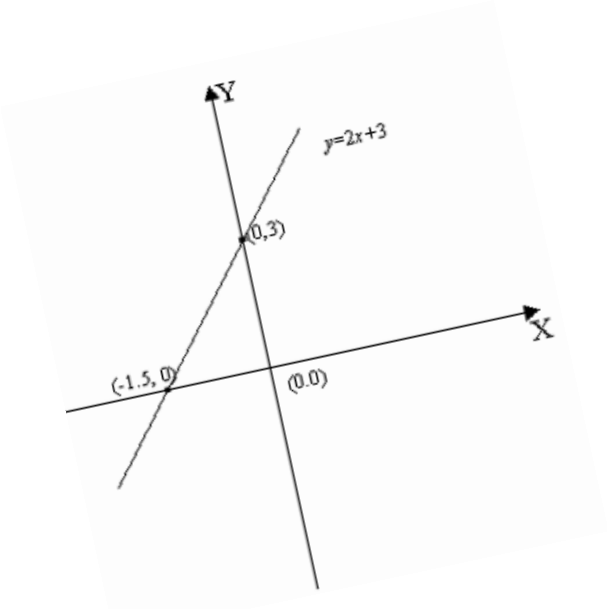
$$C = 0.15t + 20$$

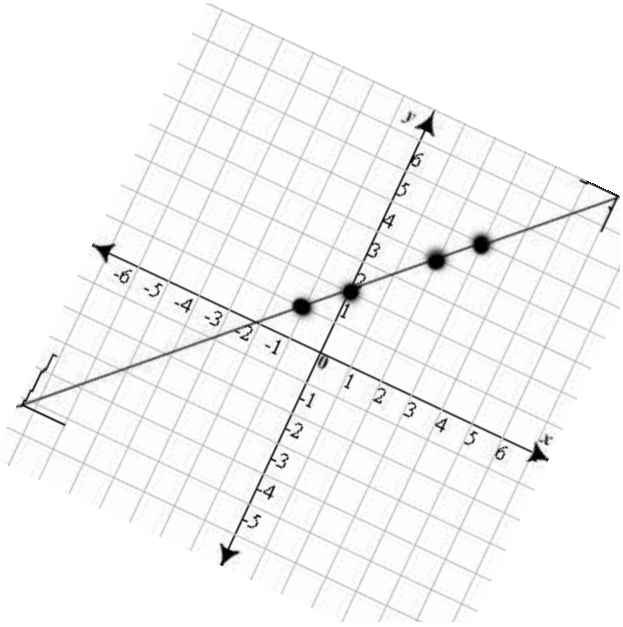
ii) How much would your bill be if you sent 123 text messages in one month?

$$\begin{aligned} C &= 0.15t + 20 \\ &= 0.15(123) + 20 \\ &= 18.45 + 20 \\ &= 38.45 \end{aligned}$$

Section 4.2
Linear Relations







Remember ME

Let's look at it again.

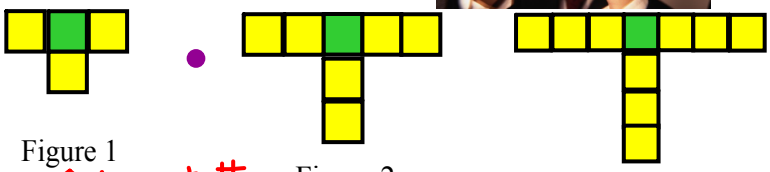
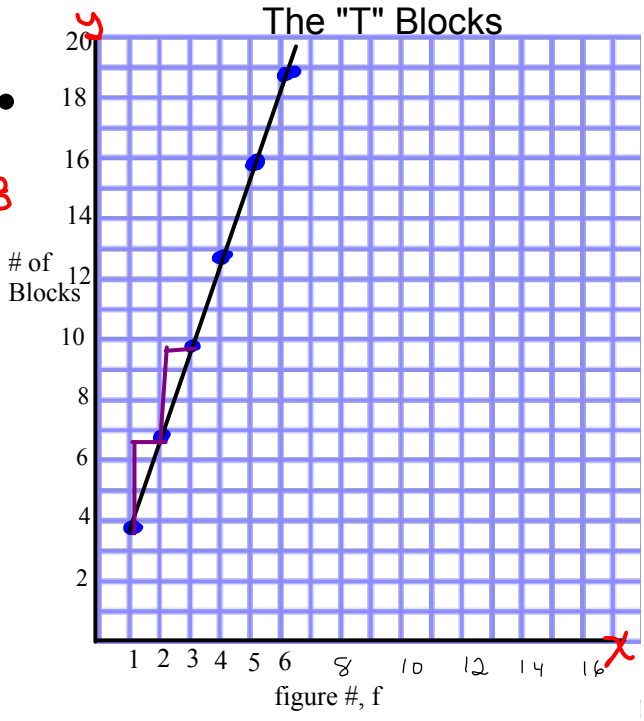


Figure 1 Figure 2 Figure 3

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

Figure #	# of Blocks
1	4
2	7
3	10
4	13
5	16
6	19
	3f + 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???

So the value of Blocks depends on the value of Figure

f	B
x	y

Dependent VS. Independent

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

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

x	y

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) ↔

x => independent

y => dependent

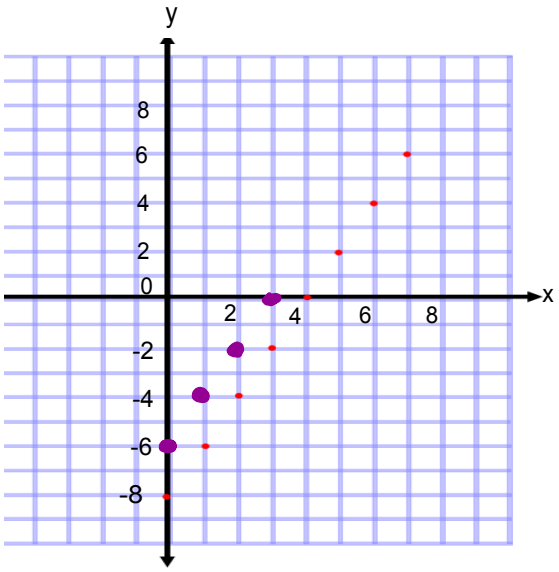
Linear Relation

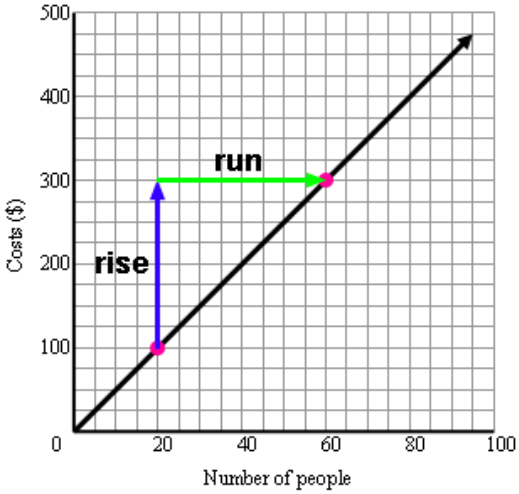
- is when the graph is a straight line
- a constant change in 'x' causes a constant change in 'y'

Table of Values

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

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





Concrete vs. Discrete

Discrete : Dots

Concrete: line (connected dots)
(Continous)

Think about the two situations

Cost of video games

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

+1, +1 (Number of Video games); +25, +25 (Cost, C($))

Linear

Can you buy 1.5 video games?

No

So would you connect the dots???

Babysitting Job

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

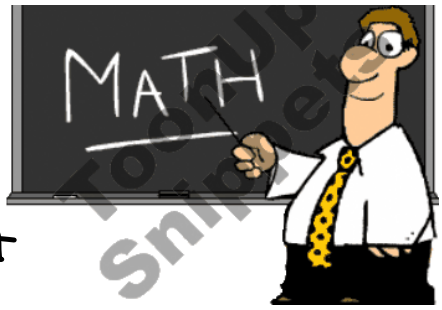
+1, +1 (Number of Hours); +10, +10 (Earnings, C($))

Linear

Can you work 1.5 hours?

Yes

So would you connect the dots???



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

$y = -2x + 7$

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

We have to do some work!

for x = -2

y =

)-2)-2)-2)-2

x= -2

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

$y = 4 + 7$

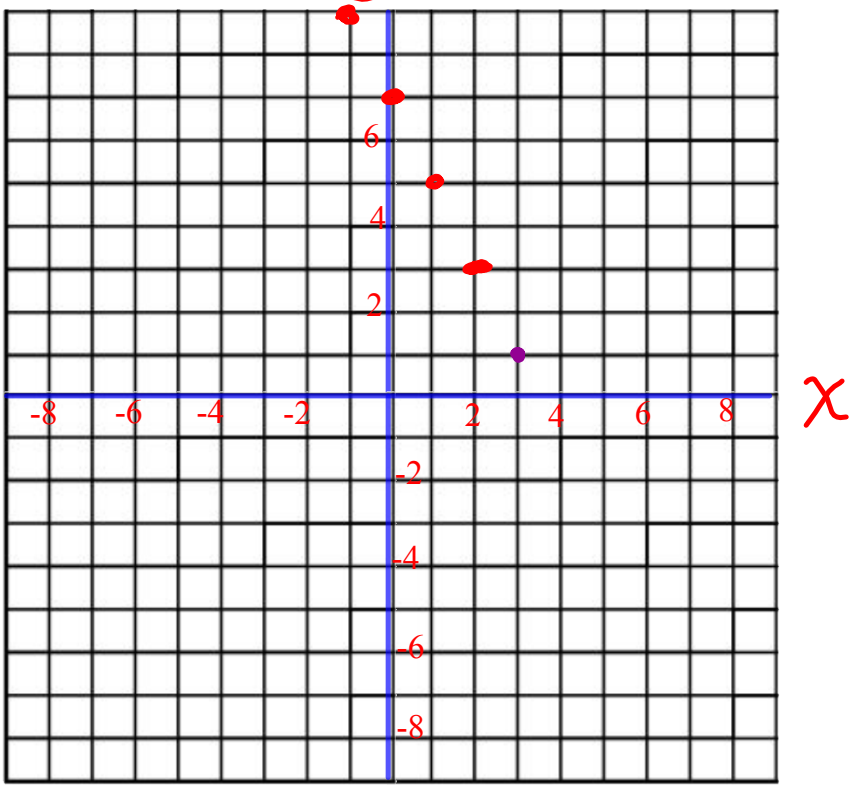
$y = 11$

x= -1

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

$y = 2 + 7$

$y = 9$

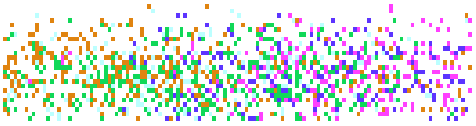


$y = \frac{-2x}{1} + 7$

$\Delta y = -2$

$\Delta x = 1$

Class/Homework



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#4 Write a sentence for each

#5 a, b, c (i, ii, iii)

Write out the chart and show the common change in x any in y if it exist.

7 a,d

8 a-e

9 a,c

#10 a,c,e