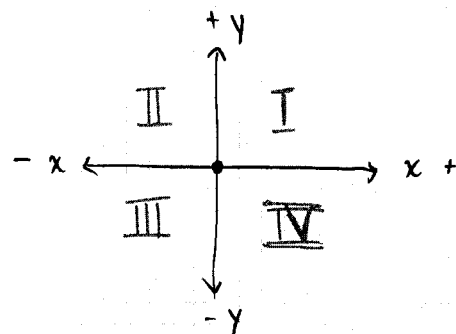


Relationships between two Quantities

October 25 17 9:41 AM

An x - y grid is called a Cartesian Plane

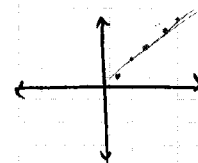
- x -axis is horizontal
- y -axis is vertical
- centre is called the origin $(0,0)$



- Any point can be described using an ordered pair (x,y) ← also called a co-ordinate
- There are 4 quadrants on the x - y grid.

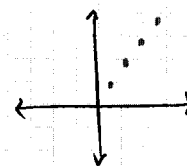
Points on a grid:

- ① continuous - all the values between the points are included (connect the dots)



ex.
price
of
bulk
candy

- ② discrete - only the exact points are included (Do NOT connect the dots)



Movie
tickets

• In Math, comparing 2 sets of elements (numbers) is called a relation:

→ we can describe relations using:

1. Equation
2. Table of values
3. Ordered pairs
4. Graph
5. Mapping

$$x \rightarrow y$$
$$5 \rightarrow 3$$

6 → 4

7 → 5

x-value: Independent variable (you choose)
"Input" value (substitute into equation)

y-value: Dependent variable (depends on x-value)
"Output" value (sub. x in the eqn, solve for y)

* Describing Patterns *

Ex. In the pattern below, each line represents a toothpick:



figure 1



figure 2

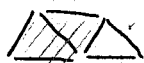
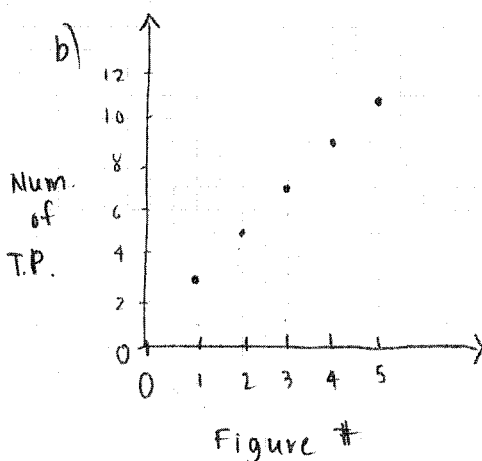


figure 3

- a) Build a table of values comparing the figure # to the # of toothpicks.
- b) create a graph
- c) create an equation to model the situation

a)

(N) (Input) Figure #	(output) (T) # of TP
1	3
2	5 $\downarrow +2$
3	7 $\downarrow +2$
4	9 $\downarrow +2$
5	11 $\downarrow +2$



* Discrete
(do not join points)

c) Equation

$$y = \boxed{2}x + \boxed{1}$$

↑ what's the change
2

↑ starting amount

$$T = 2N + 1$$

Test it

d) If there are 83 toothpicks, what is the figure #?
(use the equation!)

$$T = 2N + 1$$

$$83 = 2N + 1 \quad \text{solve for } N$$

$$\begin{array}{r} -1 \\ 83 = 2N + 1 \\ \hline \end{array}$$

$$\frac{82}{2} = \frac{2N}{2}$$

$$\boxed{41 = N}$$

e) How many toothpicks are in figure # 27?

(use the equation)

$$T = 2N + 1$$

$$T = \underline{2(27)} + 1$$

$$T = 54 + 1$$

$$\boxed{T = 55}$$

Finish p. 392 # 1-5 (from yesterday)

p. 406 # 2, 4, 6