

4.1 * Relations and Functions *

Note: We look at patterns, trends, links, and cause-effect to build math models that can predict and manage future opportunities.

Remark: A relation is a set of ordered pairs. Relations can also be expressed as

- a graph
- an equation aka formula

Def'n: A function is a relation in which the x coordinate is not repeated.

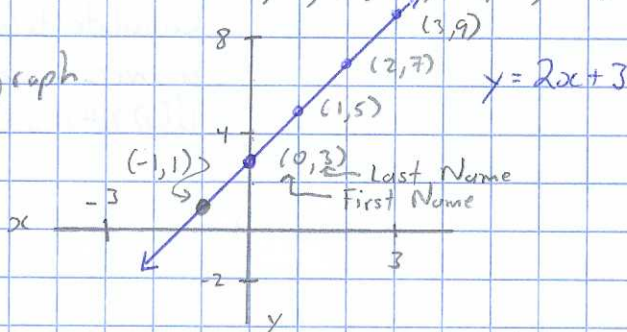
Ex, $y = 2x + 3$ is a relation

a) Generate a small set of ordered pairs.

Sol'n Relation = $\{(0, 3), (1, 5), (2, 7), (3, 9)\}$, sub in for x and solved for y .

b) Draw a graph

Sol'n



Note: $y = 2x + 3$ relation is a function with

list of first names \rightarrow domain = $\{\text{all } x\text{'s}\}$
list of last names \rightarrow range = $\{\text{all } y\text{'s}\}$

Ex₂ Given relation $y = 2x - 5$, find the value of y when the value of x is 3,

Sol'n

$$\begin{aligned} y &= 2x - 5 \\ y &= 2(3) - 5 \\ y &= 1 \end{aligned}$$

So $(3, 1)$ is an ordered pair for relation $y = 2x - 5$.
input \uparrow \downarrow output

Ex₃ Given $y = 4x - 3$, find y when $x = 4p - 2020$

Sol'n

$$\begin{aligned} y &= 4(4p - 2020) - 3, \text{ just sub in.} \\ &= 16p - 8080 - 3, \text{ distribute} \\ &= 16p - 8083, \text{ tidy up} \end{aligned}$$

Ex 4 The relation $y = 3x + 4$ has domain $\{1, 3, 5\}$. Find the range.

Sol'n

$$x = 1$$

$$y = 3(1) + 4$$
$$y = 7$$

$$x = 3$$

$$y = 3(3) + 4$$
$$= 13$$

$$x = 5$$

$$y = 3(5) + 4$$
$$y = 19$$

So range is $\{7, 13, 19\}$

Ex 5 Set up a table of easy points that you would use to graph the relation $y = x^3$. Do not graph the relation, just set up the table.

Sol'n

Domain

x

y

Range

Your choice
of numbers

or

Numbers given
to you.

"Put ins
aka"
"Inputs"

-3	$(-3)^3 = -27$
-2	$(-2)^3 = -8$
-1	$(-1)^3 = -1$
0	$(0)^3 = 0$
1	$(1)^3 = 1$
2	$(2)^3 = 8$

Calculate formula
answers using
BEDMAS order.

"Outputs"

P197 # (1, 2) every other letter

(4, 5) a) → e)

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