

FUNCTIONS

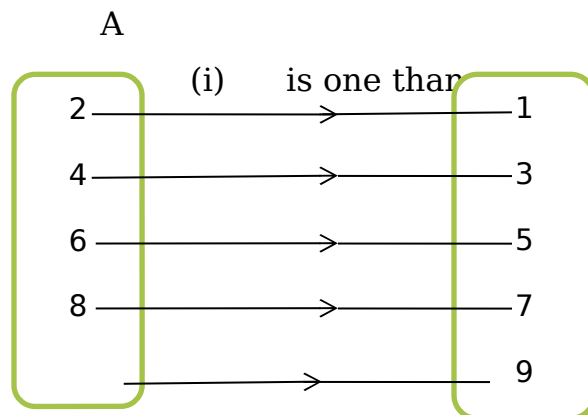
- When two members of the two sets are connected, it is called a relationship
- A relation is a collection of ordered pairs. A function is a special type of relation
- Functions and relations can be represented by:
 - (i) a mapping (ii) a table (iii) an ordered pair (iv) an algebraic sentence (v) a graph

QUESTIONS

1. A relation from set A $\{= 2, 4, 6, 8\}$ to $\{ \text{set B} = \}$ $\{1, 3, 5, 7, 9\}$ is given as “is one more than”

(a) Draw an arrow diagram to show the relation

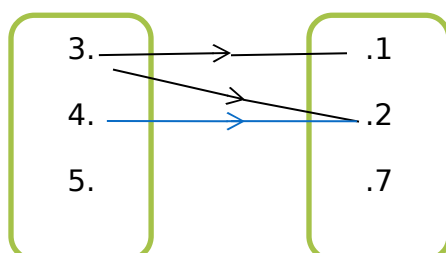
Answers

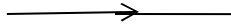


(b) the type of relationship

one - to - one relationship

2. Study the mapping below





(a) Complete the following

(i) 3 is mapped into and

Answer 1 and 2

(ii) 4 is mapped into.....

Answer 2

(iii) 5 is mapped into.....

Answer 7

(a) List the set of:

(i) The domain

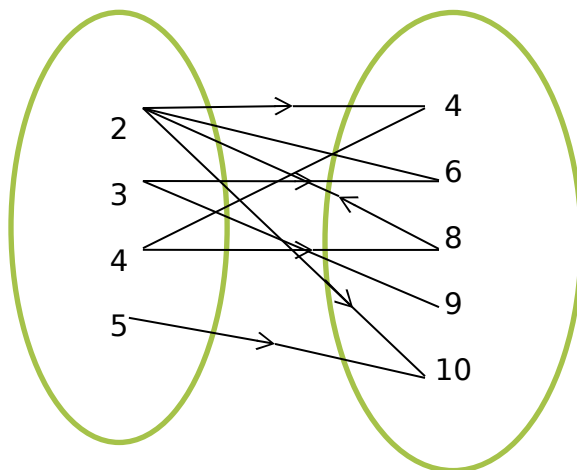
Answer - Domain $\left\{ = \right\} 3, 4, 5$

(ii) The range

Answer - Range $\left\{ = \right\} 1, 2, 7$

3. Set $D = \left\{ (2,4), (2, 6), (2,8), (2,10), (3, 6), (3, 9), (4,4), (4,8), (5, 10) \right\}$

(a) Illustrate this information on an arrow diagram.



4. Complete the following table

	Input	$f: x \longrightarrow 3x + 1$	Output	Ordered pair
i.	1	$f: x \quad 3(1) + 1$	4	(1,4)

ii.	0	f: x $\longrightarrow$ 3 (0) + 1		
iii.	2			
.				
iv				
.				

Answer

	input	f: x $\longrightarrow$ 3x + 1	Output	Ordered pair
i.	1	f: x $\longrightarrow$ 3(1) + 1	4	(1,4)
ii.	0	f: x $\longrightarrow$ 3(0) + 1	1	(0,1)
iii	-2	f: x $\longrightarrow$ 3 (-2) +	-5	(-2, -5)
.	-3	1	-8	(-3, -8)
iv		f: x $\longrightarrow$ 3(-3) +		
.		1		

5. A function f is such that $f(t) = 2t - 2$. Find:

(a) $f(0)$ (b) $f(2)$ (c) $f\left(-\frac{1}{2}\right)$

$$\frac{-1}{2}$$

(a) $f(t) = 2t - 2$ (b) $f(t) = 2t - 2$ (c) f

$$f(t) = 2(t) - 2$$

$$f(0) = 2(0) - 2$$

$$= 2\left(-\frac{1}{2}\right) - 2$$

$$= 0 - 2$$

$$= -1 - 2$$

$$= -2$$

$$= -3$$

$$f(2) = 2(2) - 2$$

$$= 4 - 2$$

$$= 2$$

6. Given that the ordered pairs (m, 25) and (n, -10) belong to the mapping $h: x \longrightarrow x + 4$

Find the values of M and n.

Answer

(M, 25)

$$h: x \longrightarrow x + 4$$

$$h(x) = x + 4$$

$$h(m) = M = 4$$

$$25 = M + 4$$

(n, -10)

$$\longrightarrow h: x \longrightarrow x + 4$$

$$\longrightarrow h(x) \longrightarrow x + 4$$

$$h(n) = n + 4$$

$$25 - 4 = M$$

$$\mathbf{21 = M}$$

$$-10 = n + 4$$

$$-10 - 4 = n$$

$$\mathbf{-14 = n}$$

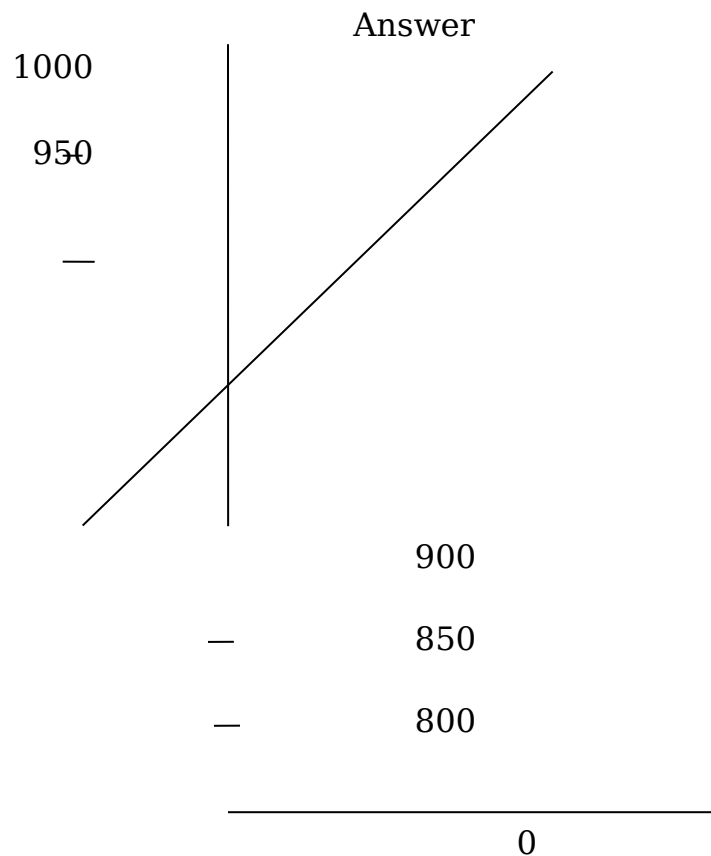
7. In the first year, Grace made K800 selling cellphones. She increased her earnings by K50 each year for the next four years

(a) Draw up a table

(b) Draw up a linear graph

Answer

Year	Earnings
1	K800
2	K850
3	K900
4	K950



(c) Write the co-ordinate pairs
algebraic sentence

	Answer	
	$(x, y) \longrightarrow$	(1, K800)
Sentence		
		(2, K850)
K50		(3, K900)
		(4, K950)

(d) Write an

Answer
Algebraic
$Y = x +$

(a) Give the domain and range

Domain = {1, 2, 3, 4}

Range = {K800, K850, K900, K950}

PRACTICE QUESTIONS

- If $f : x \longrightarrow \frac{2}{3x} + 5$, find
 - $f(2)$
 - x when $f(x) = 7$
 - $f^{-1}(x)$
- A function h is defined as $h(x) = \frac{1}{2}x - 5$, find
 - $h(-4)$
 - the value of x for which $h(x) = 3$
 - $h^{-1}(x)$
- Given that $f(x) = \frac{3x-5}{2}$ and $g(x) = \frac{x-4}{6}$, find
 - $f(-9)$
 - $f^{-1}(x)$
 - the value of x for $f(x) = 3g(x)$
- If $h(x) = 3x - 5$, find
 - $h(3)$
 - $h(x) = 10$
 - $h^{-1}(x)$

EXPECTED ANSWERS

- a) $5\frac{2}{6}$ or $5\frac{1}{2}$

$$\text{b) } X = \frac{1}{3}$$

$$\text{c) } f^{-1}(x) = \frac{2}{3x-15}$$

$$2. \text{ a) } h(-4) = -7$$

$$\text{b) } X = 16$$

$$\text{c) } h^{-1}(x) = 2x + 10$$

$$3. \text{ a) } f(-9) = -16$$

$$\text{b) } f^{-1}(x) = \frac{2x+5}{3}$$

$$\text{c) } X = \frac{1}{2}$$

$$4. \text{ a) } h(3) = 4$$

$$\text{b) } X = 5$$

$$\text{c) } h^{-1}(x) = \frac{x+5}{3}$$