



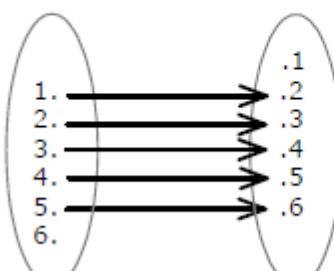
1	If the ordered Pairs $(x-1, y+3)$ and $(2, x+4)$ are equal, find x and y (i) $(3,3)$ (ii) $(3,4)$ (iii) $(1,4)$ (iv) $(1,0)$
2	If, $n(A) = 3, n(B) = 2, A$ And B are two sets Then no. of relations of $A \times B$ have. (i) (6) (ii) (12) (iii) (32) (iv) (64)
3	Let $f(x) = - x $ then Range of function (i) $(0, \infty)$ (ii) $(-\infty, \infty)$ (iii) $(-\infty, 0)$ (iv) none of there
4	A real function f is defined by $f(x) = 2x - 5$. Then the Value of $f(-3)$ (i) -11 (ii) 1 (iii) 0 (iv) none of there
5	Let $R = \{(x, -y) : x, y \in \mathbb{W}, 2x + y = 8\}$ then (i) Find the domain and the range of R (ii) Write R as a set of ordered pairs.
6	If $f(x) = \frac{x^2 - 3x + 1}{x - 1}$, find $f(-2) + f\left(\frac{1}{3}\right)$
7	Find the domain and the range of the function $f(x) = 3x^2 - 5$. Also find $f(-3)$ and the numbers which are associated with the number 43 in its range.
8	Find the domain and the range of the function $f(x) = \sqrt{x-1}$
9	Let a relation $R = \{(0,0), (2,4), (-1,2), (3,6), (1,2)\}$ then (i) write domain of R (ii) write range of R (iii) write R the set builder form (iv) represent R by an arrow diagram
10	Let $A = \{1,2,3\}$, $B = \{1,2,3,4\}$ and $R = \{(x,y) : (x,y) \in A \times B, y = x+1\}$ (i) find $A \times B$ (ii) write R in roster form (iii) write domain & range of R (iv) represent R by an arrow diagram
11	Find the domain and the range of the following functions $f(x) = \frac{1}{\sqrt{5-x}}$

12	Let $f(x) = x+1$ and $g(x) = 2x-3$ be two real functions. Find the following functions (i) $f+g$ (ii) $f-g$ (iii) fg (iv) $\frac{f}{g}$ (v) f^2-3g
13	Find the domain and the range of the following functions (i) $f(x) = \frac{x-3}{2x+1}$ (ii) $f(x) = \frac{x^2}{1+x^2}$ (iii) $f(x) = \frac{1}{1-x^2}$
14	Let f be a function defined by $F : x \rightarrow 5x^2 + 2, x \in R$ (i) find the image of 3 under f (ii) find $f(3) + f(2)$ (iii) find x such that $f(x) = 22$
15	If $A = \{1, 2\}$, find $(A \times A \times A)$
16	If A and B are two sets containing m and n elements respectively how many different relations can be defined from A to B ?
17	A Function f is defined by $f(x) = 2x - 3$ find $f(5)$
18	If $A = \{1, 2, 3\}$ $B = \{3, 4\}$ and $C = \{4, 5, 6\}$ find (i) $A \times (B \cup C)$ (ii) $A \times (B \cap C)$ (iii) $(A \times B) \cap (B \times C)$
19	Let $A = \{1, 2\}$, $B = \{1, 2, 3, 4\}$, $C = \{5, 6\}$ and $D = \{5, 6, 7, 8\}$ verify that (i) $A \times (B \cap C) = (A \times B) \cap (A \times C)$ (ii) $A \times C$ is subset of $B \times D$
20	Find the domain and the range of the relation R defined by $R = \{(x+1, x+3) : x \in (0, 1, 2, 3, 4, 5)\}$
21	Let $A = \{1, 2, 3, 4, 5, 6\}$ define a relation R from A to A by $R = \{(x, y) : y = x+1, x, y \in A\}$ (i) write R in the roster form (ii) write down the domain co domain and range of R (iii) Represent R by an arrow diagram
22	Find the domain and the range of the following functions: (i) $f(x) = \sqrt{x^2 - 4}$ (ii) $f(x) = \sqrt{16 - x^2}$ (iii) $f(x) = \frac{1}{\sqrt{9 - x^2}}$



Relations and Functions (Answer Key)

1	(3,4)	2	64
3	$(-\infty, 0)$	4	-11
5	Domain of $R = \{0, 1, 2, 3, 4\}$ and range of $R = \{8, 6, 4, 2, 0\}$		
6	Domain = $\mathbb{R} - \{1\}$		
7	Domain = \mathbb{R} , Range = $[-5, \infty)$		
8	Domain = $[1, \infty)$, Range = $[0, \infty)$		
9	<p>Given $R = [(0, 0), (2, 4), (-1, -2), (3, 6), (1, 2)]$</p> <p>(i) Domain of $R = [0, 2, -1, 3, 1]$</p> <p>(ii) Rang of $R = [0, 4, -2, 6, 2]$</p> <p>(iii) R in the builder form can be written as $R = [(x, y) : x \in I, -1 \leq x \leq 3, y = 2x]$</p> <p>(iv) The reaction R can be represented by the arrow diagram are shown.</p>		
10	<p>(i) $\{(1, 1), (1, 2), (1, 3), (1, 4)$ $(2, 1), (2, 2), (2, 3), (2, 4)$ $(3, 1), (3, 2), (3, 3), (3, 4)\}$</p> <p>(ii) $R = [(1, 2), (2, 3), (3, 4)]$</p> <p>(iii) Domain of $R = \{1, 2, 3\}$ and range of $R = \{2, 3, 4\}$</p>		
11	$D_f = (-\infty, 5)$ $R_f = (0, \infty)$		
12	<p>(i) $(f + g)(x) = f(x) + g(x) = (x+1) + (2x-3) = 3x-2$, for $x \in \mathbb{R}$</p> <p>(ii) $(f - g)(x) = f(x) - g(x) = (x+1) - (2x-3) = -x+4$, for all $x \in \mathbb{R}$</p> <p>(iii) $(fg)(x) = f(x)g(x) = (x+1)(2x-3) = 2x^2 - x - 3$, for all $x \in \mathbb{R}$</p> <p>(iv) $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)} = \frac{x+1}{2x-3}, x \neq \frac{3}{2}, x \in \mathbb{R}$</p> <p>(v) $(f^2 - 3g)(x) = (f^2)(x) - (3f)(x) = (f(x))^2 - 3g(x)$ $= (x+1)^2 - 3(2x-3) = x^2 + 2x + 1 - 6x + 9$ $= x^2 - 4x + 10$, for all $x \in \mathbb{R}$</p>		

13	$D_F = R - \left[-\frac{1}{2}\right]$ $R_F = R - \left[\frac{1}{2}\right]$ $D_F = R$ $R_F = (0,1)$ $D_F = R - [-1,1]$ $R_F = (-\infty, 0) \cup (1, \infty)$.
14	(i) $f(3) = 5 \times 3^2 + 2 = 5 \times 9 + 2 = 47$ (ii) $f(2) = 5 \times 2^2 + 2 = 5 \times 4 + 2 = 22$ $\therefore f(3) \times f(2) = 47 \times 22 = 1034$ (iii) $f(x) = 22$ $\Rightarrow 5x^2 + 2 = 22$ $\Rightarrow 5x^2 = 20$ $\Rightarrow x^2 = 4$ $\Rightarrow x = 2, -2$
15	$A \times A \times A = \{(1,1,1), (1,1,2), (1,2,1), (2,1,1), (2,2,1), (2,2,2)\}$
16	2^{m+n}
17	$f(x) = (2 \times 5 - 3) = 7$
18	$\{(1,3), (1,4), (1,5), (1,6), (2,3), (2,4), (2,5), (2,6), (3,3), (3,4), (3,5), (3,6)\}$ $A \times (B \cap C) = \{1, 2, 3\} \times \{4\} = \{(1,4), (2,4), (3,4)\}$ $(A \times B) \cap (B \times C) = \{(3,4)\}$
20	Domain of $R = [1, 2, 3, 4, 5, 6]$ and range of $R = [3, 4, 5, 6, 7, 8]$
21	(i) $\{(1,2), (2,3), (3,4), (4,5), (5,6)\}$ (ii) Domain = $\{1, 2, 3, 4, 5\}$ co domain = A , range = $\{2, 3, 4, 5, 6\}$ (iii) 
22	$D_F = (-\infty, -2] \cup [2, \infty)$. $R_F = [0, \infty)$ $D_F = [-4, 4]$. $R_F = [0, 4]$ $D_F = (-3, 3)$ $R_F = \left[\frac{1}{3}, \infty\right)$