

BCM SCHOOL BASANT AVENUE DUGRI ROAD LUDHIANA
ASSIGNMENT (RELATION AND FUNCTIONS)
CLASS XII SC

1	Let $A = \{1, 2, 3\}$. Then, the number of relations containing $(1, 2)$ and $(1, 3)$ which are reflexive and symmetric but not transitive is (a) 1 (b) 2 (c) 3 (d) 4
2	If $A = \{a, b, c\}$ and $B = \{-3, -1, 0, 1, 3\}$, then the number of injections that can be defined from A to B is (a) 125 (b) 243 (c) 60 (d) 120
3	Assertion(A) the modulus function $f: \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = x $ is neither one -one nor onto. Reason(R) the signum function $f: \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = \begin{cases} 1, & x > 0 \\ 0, & x = 0 \\ -1, & x < 0 \end{cases}$ is bijective.
4	If $f, g: \mathbb{R} \rightarrow \mathbb{R}$ be two functions defined as $f(x) = x + x$ and $g(x) = x - x, \forall x \in \mathbb{R}$. Then, find fog and gof. Hence find fog (-3) , fog (5) and gof (-2) .
5	Show that the relation R defined by $(a, b) R (c, d) \Rightarrow a + b = b + c$ on the set $\mathbb{N} \times \mathbb{N}$ is an equivalence relation.
6	Show that if $f: \mathbb{R} - \left\{\frac{7}{5}\right\} \rightarrow \mathbb{R} - \left\{\frac{3}{5}\right\}$ is defining by $f(x) = \frac{3x+4}{5x-7}$ and $g: \mathbb{R} - \left\{\frac{3}{5}\right\} \rightarrow \mathbb{R} - \left\{\frac{7}{5}\right\}$ is define by $g(x) = \frac{7x+4}{5x-3}$ then fog = IA and gof = IB when $A = \mathbb{R} - \left\{\frac{3}{5}\right\}$ $B = \mathbb{R} - \left\{\frac{7}{5}\right\}$; IA $(x) = x$, for all $x \in A$, IB $(x) = x$, for all $x \in B$ are called identify function on set A and B respectively.
7	Show that the function $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \frac{x}{1+x^2}, x \in \mathbb{R}$, is neither one-one nor onto.
8	Show that the function $f: \mathbb{R} \rightarrow \{x \in \mathbb{R} : -1 < x < 1\}$ defined by $f(x) = \frac{x}{1+ x }, x \in \mathbb{R}$ is one-one and onto function.
9	If $f(x) = e^x$ and $g(x) = \log_e x (x > 0)$ fong gof and fog. Are they equal?

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Sherlin and Danju are playing Ludo at home during Covid-19. While rolling the dice, Sherlin's sister Raji observed and noted the possible outcomes of the throw every time belongs to set $\{1,2,3,4,5,6\}$. Let A be the set of players while B be the set of all possible outcomes. $A = \{S, D\}$, $B = \{1,2,3,4,5,6\}$



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of

(i) Raji wants to know the number of functions from A to B. How many numbers of functions are possible?

(ii) Let R be a relation on B defined by $R = \{(1,2), (2,2), (1,3), (3,4), (3,1), (4,3), (5,5)\}$. Then R is

(iii) Let $R: B \rightarrow B$ be defined by

$R = \{(1,1), (1,2), (2,2), (3,3), (4,4), (5,5), (6,6)\}$, then R is

(iv) Raji wants to know the number of relations possible from A to B. How many numbers of relations are possible?