

Tutorial - 2

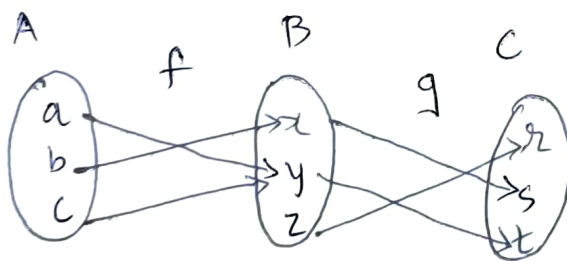
Q.1 State whether or not each of the following diagram defines a function from $A = \{a, b, c\}$ into $B = \{x, y, z\}$



{Ans: (1) No (2) No (3) Yes.}

Q.2 Sketch the graph of (a) $f(x) = x^2 + x - 6$
(b) $g(x) = x^3 - 3x^2 - x + 3$

Q.3 Let, the functions $f: A \rightarrow B$ and $g: B \rightarrow C$ be defined by the following figure. Find the composition function $g \circ f: A \rightarrow C$.



{Ans: $g \circ f(a) = r$
 $g \circ f(b) = s$
 $g \circ f(c) = t$ }

Q.4 Determine if each function is one-to-one:

(a) To each person on the earth assign the number which corresponds to his age.

(b) To each country in the world assign the latitude and longitude of its capital.

(c) To each book written by only one authors.

(d) To each country in the world which has a prime minister assign its prime minister

{Ans (a) No (b) Yes (c) No (d) Yes}

Q.5 Check whether the following functions are one to one or onto.

$A = \{a, b, c, d\}$, $B = \{s, t, u\}$, $C = \{1, 2\}$. Let, $f: A \rightarrow B$,
 $g: B \rightarrow C$, $h: C \rightarrow A$, $f = \{(a, s), (b, u), (c, t), (d, u)\}$,
 $g = \{(s, 1), (t, 1), (u, 2)\}$, $h = \{(1, b), (2, c)\}$.

Ans: f - onto, g - onto, h - one to one.

Q.6 Define the following terms:

a) Injective b) Surjective c) Bijective.

Q.7 Find (a) $\lfloor 7.5 \rfloor$, $\lfloor -7.5 \rfloor$, $\lfloor -18 \rfloor$

(b) $\lceil 7.5 \rceil$, $\lceil -7.5 \rceil$, $\lceil -18 \rceil$