

XII- Mathematics Assignment No-03 -Relations and Functions

Q1. Define Composite function, fog , gof
for any given three sets A, B, C

Draw diagram, also

Q2. Let $A = \{3, 4, 5, 6\}$, $B = \{13, 14, 15, 16\}$
 $C = \{23, 24, 25\}$

Given $f: A \rightarrow B : f = \{(3, 13), (4, 14), (5, 15), (6, 16)\}$
 $g: B \rightarrow C : g = \{(13, 23), (14, 24), (15, 24), (16, 25)\}$

Q3. Let $f: R \rightarrow R$; $g: R \rightarrow R$ such that
 $f(n) = n^2$ and $g(n) = n+1$
Show that $fog \neq gof$

Q4. Let $f: R \rightarrow R$ be defined by $f(n) = 3n-7$.
Show that f is invertible. also find its
inverse function $g = f^{-1}: R \rightarrow R$.

Q5. If $f: A \rightarrow B$
 $g: B \rightarrow C$

f and g are onto functions. Show
that gof is an onto function

Cont Pg-2

Q6. Let $f: N \rightarrow R$ be a function defined by $f(n) = 9n^2 + 12n + 11$, for some $n \in N$. Show that $f: N \rightarrow S$, where S is the range of f is invertible. Find the inverse of f .

Q7. If $f(n) = \sqrt{n}$ ($n \geq 0$) and $g(n) = n^2 - 1$ are two real functions. Evaluate fog and gof . Is $fog = gof$?

Q8. If $f(n) = \frac{3n-2}{2n-3}$, Show $f(f(n)) = n$ $\forall n \in R - \{\frac{3}{2}\}$

Q9. If $f: R \rightarrow R$ such that $f(n) = (3-n^3)^{\frac{1}{3}}$ then Show $fof(n) = n$

Q10. Consider $f: \{1, 2, 3\} \rightarrow \{a, b, c\}$ given by $f(1) = a$, $f(2) = b$, $f(3) = c$
Find f^{-1} and Show that $(f^{-1})^{-1} = f$

ANS:-

Q1. $gof: A \rightarrow C$: $gof(a) = g(f(a))$ $\forall a \in A$	(Q4) $g = f^{-1} = \frac{y+7}{3}$	(Q7) $fog(n) = \sqrt{n^2 - 1}$ $gof(n) = n - 1$ $fog \neq gof.$
Q2. $gof = \{(3, 23), (4, 23), (5, 24), (6, 25)\}$	(Q6) $g = f^{-1} = \frac{\sqrt{y-7}-2}{3}$	Q8 $f\{a, b, c\} = \{1, 2, 3\}$