

CHAPTER: INVERSE TRIGONOMETRIC FUNCTONS

Relations and Functions

1. If $f(x) = |x|$ and $g(x) = |5x - 2|$, f, g are real functions, find $f \circ g$ and $g \circ f$.
2. If $f(x) = x^2 - 3x + 2$ and $f : R \rightarrow R$, find $f(f(x))$.
3. If $f(x) = e^x$, $g(x) = \log_e x, x > 0$. Find $f \circ g$ and $g \circ f$. Is $f \circ g = g \circ f$.
4. Let $f(x) = \frac{x}{\sqrt{1+x^2}}$, then show that $(f \circ f \circ f)(x) = \frac{x}{\sqrt{1+3x^2}}$.
5. Is the function $f : [0, \infty) \rightarrow R$ given by $f(x) = \frac{x}{x+1}$ is bijective.
6. Let $A = \{1, 2, 3, 4\}$, $B = \{a, b, c\}$; then find the number of functions from $A \rightarrow B$ which are not onto?
7. Let $*$ be a binary operation on Z defined by $a * b = a + b - 4, \forall a, b \in Z$.
 - (i) Show that $*$ is commutative and associative
 - (ii) Find identity element in Z
 - (iii) Find invertible elements in Z
8. Find the number of binary operations that can be defined on a set of 2 elements?
9. If $f : (1, \infty) \rightarrow (2, \infty)$ is given by $f(x) = x + \frac{1}{x}$, then find f^{-1} .
10. Is the binary operation $*$ defined on the set N , given by $a * b = \frac{a+b}{2}$ for all

$$a, b \in N$$

Commutative and associative?