

SELF ASSESSMENT TEST -1**CLASS 10+2****RELATIONS AND FUNCTION**

1. Give an exp to show that relation R
 - (a) Which is reflexive ,symmetric but not transitive
 - (b) Symmetric neither reflexive nor transitive
 - (c) Reflexive but neither symm. & nor transitive.
2. Check whether the relation R on the set R of reals is reflexive, symm. or transitive where $R = \{ (a,b) : a \leq b^3 \}$.
3. Check whether the relation R in the set N of natural numbers defined as $R = \{ (x,y) : y = x + 5 \text{ and } x < 4 \}$
4. Prove that the relation R in Z of integers defined as $R = \{ (x,y) : 2x - 2y \text{ is an integer} \}$ is an equivalence relation.
5. Show that the relation R in Z of integers given by $R = \{ (a,b) : 5 \text{ divides } a - b \}$ is an equivalence relation.
6. Show that the relation R in Z of integers given by $R = \{ (a,b) ; a - b \text{ is multiple of } 4 \}$ is an equivalence relation.
7. Prove relation in a set S is set of all triangles in a plane given by $R = \{ (a,b) : a \text{ and } b \text{ have equal perimeters} \}$
8. Let Z be the set of integers and $R = \{(a,b): |a-b| = \text{even}\}$. show R is equivalence relation
9. Let L be the all lines in XY plane and R is the relation in L defined as $R = \{ (L_1, L_2): L_1 \text{ parallel } L_2 \}$ show that R is equivalence relation.
10. Show that $f : R \rightarrow R$ given by $f(x) = 4x + 5$ is bijection.
11. Show that $f : R \rightarrow R$ defined by $f(x) = x^3$ is bijective

12. Check the injective and surjective of function $f : \mathbb{R} \rightarrow \mathbb{R}$ given by $f(x) = 2x^2 + 5$
13. Let $f : \mathbb{R} - \{3\} \rightarrow \mathbb{R} - \{1\}$ defined by $f(x) = \left(\frac{x-2}{x-3}\right)$ is 'f' one-one & onto? justify your answer.
14. Prove that $f : \mathbb{R} \rightarrow \mathbb{R}$ given that $f(x) = |x|$ is neither one-one nor onto.
15. Let $f : \left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \rightarrow [-1, 1]$ defined by (a) $f(x) = \sin x$ (b) $f(x) = \cos x$
Is both 'f' one-one & onto?
16. Find $f \circ g$, $g \circ f$, $f \circ f$, $g \circ g$, if $f(x) = x^2$, $g(x) = \sin x$.
17. Find $f \circ g$, $g \circ f$ where $f(x) = \log x$ & $g(x) = e^x$.
18. Let f be a greatest integer and g be the modulus function.
Find the value of $g \circ f \left(\frac{-5}{2}\right) - f \circ g \left(\frac{-5}{2}\right)$.