

Worksheet: Relations and Functions

Gujarat State Board · Class 12 · Mathematics · 8 questions · 30 marks

Name: _____

Date: _____

Score: _____ / 30

Q1. Check whether the relation $R = \{(1,1), (2,2), (3,3), (1,2)\}$ on the set $\{1,2,3\}$ is reflexive. [2 marks]

Q2. Is $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = 5x - 3$ one-one? [2 marks]

Q3. Show that $R = \{(a,b) : a-b \text{ is divisible by } 3\}$ on the set of integers is an equivalence relation. [4 marks]

Q4. Show that $f: \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = x^3$ is onto. [4 marks]

Q5. If $f(x) = x+1$ and $g(x) = 2x$, find $(g \circ f)(x)$ and $(f \circ g)(x)$. Are they equal? [4 marks]

Q6. Show that $f: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = 7x - 4$ is invertible, and find f^{-1} . [5 marks]

Q7. For the equivalence relation $R = \{(a,b) : a \text{ and } b \text{ leave the same remainder when divided by } 4\}$ on the set $\{0,1,\dots,11\}$, find the equivalence class of 2. [5 marks]

Q8. $f: \{1,2,3,4\} \rightarrow \{1,2,3,4\}$ is a one-one function. Without further information, is f necessarily onto? [4 marks]
