

Worksheet: Relations and Functions

ISC · Class 11 · Mathematics · 9 questions · 25 marks

Name: _____

Date: _____

Score: _____ / 25

Q1. If $A = \{1, 2\}$ and $B = \{a, b, c\}$, find $A \times B$ and state $n(A \times B)$. [2 marks]

Q2. Let $A = \{1, 2, 3, 4, 5\}$. Define $R = \{(x, y) : y = x + 2, x, y \text{ in } A\}$. Write R in roster form and state its domain and range. [2 marks]

Q3. Is $\{(1, 4), (2, 4), (3, 4), (4, 4)\}$ a function? Is $\{(4, 1), (4, 2), (5, 3)\}$ a function? Justify each. [2 marks]

Q4. If $A \times B$ has 12 elements and $A = \{1, 2, 3, 4\}$, find $n(B)$ and give one possible set B . [3 marks]

Q5. Let $A = \{2, 3, 4, 5, 6\}$. Define R on A by $R = \{(a, b) : a, b \text{ in } A, a + b = 8\}$. Write R in roster form, and find its domain and range. [3 marks]

Q6. State the domain and range of (i) $f(x) = |x-3|$, (ii) $f(x) = 1/(x-2)$, (iii) $f(x) = [x]$ (greatest integer function). [3 marks]

Q7. State the domain and range of $f(x) = 3^x$ and $g(x) = \log_3(x)$, and identify one point each graph must pass through. [3 marks]

Q8. Let $f(x) = x^2 - 1$ and $g(x) = x + 1$, both defined on $\mathbb{R}$. Find $(f+g)(x)$, $(f-g)(x)$, $(fg)(x)$, and $(f/g)(x)$, stating any domain restriction. [4 marks]

Q9. R is a relation on $\mathbb{Z}$ defined by $R = \{(a,b) : a,b \text{ in } \mathbb{Z}, a-b \text{ is divisible by } 3\}$. Is $(5,2)$ in R ? Is $(5,1)$ in R ? Find one more pair with first element 5. [3 marks]