Worksheet: Relations and Functions

IB · 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: R -> R, f(x) = 5x - 3 one-one? *[2 marks]*

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

Q4. Show that f: R -> R, f(x) = x^3 is onto. *[4 marks]*

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

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

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

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