Class 12 Mathematics · Chapter 1: Relations and Functions

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. The number of reflexive relations in a set with 3 elements is [1]

(a) 8 (b) 512
(c) 64 (d) 27

2. Let A = {2, 4} and B = {1, 3, 5}. The number of relations from A to B is [1]

(a) 6 (b) 64
(c) 32 (d) 8

3. In the set A = {1, 2, 3, 4}, the relation R = {(a, b) : $|a^2 - b^2| < 16$} is [1]

(a) the empty relation (b) the universal relation
(c) reflexive but not symmetric (d) symmetric but not reflexive

4. The number of relations in the set {1, 2, 3} that are both reflexive and symmetric is [1]

(a) 6 (b) 64
(c) 8 (d) 512

5. Let X = {1, 2} and let R be the relation in the power set P(X) given by A R B if and only if A $\subset$ B (A is a subset of B, A = B allowed). The number of ordered pairs in R is [1]

(a) 5 (b) 16
(c) 9 (d) 4

6. Show that f : R $\to$ R, $f(x) = x^3 + 2$, is invertible, and find $f^{-1}(10)$. [2]

7. Show that f : R − {0} $\to$ R, $f(x) = \frac{x+3}{x}$, is one-one, and find the one real number that is not the image of any x. [2]

8. Let f : R $\to$ R, $f(x) = x^2 - 4x$, and let R = {(a, b) : f(a) = f(b)} in R, an equivalence relation. Find the equivalence class [1]. [2]

9. Show that f : R $\to$ R, f(x) = 2x + |x|, is one-one and onto. [3]

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10. A = {1, 2, 3, 4, 5, 6} is divided into the subsets {1, 4}, {2, 3, 5} and {6}. Write the equivalence relation R in A whose equivalence classes are these subsets, in roster form, and find the number of ordered pairs in R. [3]

11. Let A = {1, 2, 3} and B = {p, q}. Find (i) the number of functions from A to B, (ii) the number of one-one functions from A to B, (iii) the number of onto functions from A to B. [3]