

ST. LAWRENCE HIGH SCHOOL A JESUIT CHRISTIAN MINORITY INSTITUTION



Worksheet-6

SUBJECT – MATHEMATICS

Pre-test

Chapter: Relations and Functions

Topic: Relations

Class: XII

Date: 15.05.2020

 $(1 \times 15 = 15)$

Choose the correct option

1. Let R be a relation on the set N given by $R = \{(a, b): a = b - 2, b > 6\}$. Then –

a) $(2,4) \in R$, b) $(3,8) \in R$, c) $(6,8) \in R$, d) $(8,7) \in R$

2. Which of the following is not an equivalence relation on \mathbb{Z} ?

- a) $a \ R \ b \Leftrightarrow a + b$ is an even integer. b) $a \ R \ b \Leftrightarrow a - b$ is an even integer. c) $a \ R \ b \Leftrightarrow a < b$
- d) $a R b \Leftrightarrow a = b$

3. R is a relation on set \mathbb{Z} , given by $(x, y) \in R \Leftrightarrow |x - y| \le 1$. Then, R is –

- a) Reflexive and transitive
- b) Reflexive and symmetric
- c) Transitive and symmetric
- d) An equivalence relation.
- 4. The relation R defined on a set A = {1, 2, 3, 4, 5} by R = { $(a, b) : |a^2 b^2| < 16$ }, is given by
 - a) {(1,1), (2,1), (3,1), (4,1), (2,3)}
 - b) {(2,2), (3,2), (4,2), (2,4)}
 - c) {(3,3), (4,3), (5,4), (3,4)}
 - d) None of these.

- 5. Let R be a relation over the set of all straight lines in a plane such that $l_1 R l_2 \Leftrightarrow l_1 \perp l_2$, (where, l_1 and l_2 are any two straight lines) then R is
 - a) Symmetric
 - b) Reflexive
 - c) Transitive
 - d) Equivalence.

6. If $A = \{a, b, c\}$, then the relation $R = \{(b,c)\}$ on A is –

- a) Reflexive
- b) Symmetric
- c) Transitive
- d) Reflexive & Transitive.
- 7. Let *A* = {1, 2, 3}. Then, the number of relations containing (1,2) and (1,3) which are reflexive and symmetric but not transitive is
 - a) 1 , b) 2 , c) 3 , d) 4
- 8. The relation R in $\mathbb{N} \times \mathbb{N}$ such that $(a, b) R(c, d) \Leftrightarrow a + d = b + c$ is
 - a) Reflexive but not symmetric
 - b) Reflexive and transitive but not symmetric
 - c) An equivalence relation
 - d) None of these.
- 9. If A = {1,2,3} & B = {1,4,6,9} and R is a relation from A to B defined by "*x* is greater than *y*; where *x* is in A and *y* is in B". The range of R is –

a) {1,4,6,9} ; b) {4,6,9} ; c) {1} ; d) None of these.

10. If $A = \{2, 3, 4, 5\}$ & $B = \{3, 6, 7, 10\}$ and R is a relation from A to B defined by "x is relatively prime to y; where x is in A and y is in B". The domain of R is –

a) $\{2,3,5\}$; b) $\{3,5\}$; c) $\{2,3,4\}$; d) $\{2,3,4,5\}$

11. A relation Ψ from \mathbb{C} to \mathbb{R} is defined by $x R y \Leftrightarrow |x| = y$. Which one is correct?

a) $(2+3i) \Psi 13$; b) $(3) \Psi (-3)$; c) $(1+i) \Psi (2)$; d) $(i) \Psi 1$

12. Let R be a relation on N defined by x + 2y = 8. The domain of R is
a) {2,4,8};
b) {2,4,6,8};
c) {2,4,6};
d) {1,2,3,4}

13. R is a relation from {11,12,13} to {8,10,12} defined by x R y ⇔ y = x - 3. Then R⁻¹ is

a) {(8,11), (10,13)}
b) {(11,8), (13,10)}
c) {(10,13), (8,11), (8,10)}
d) None of these.

14. Let R = {(a, a), (b, b), (c, c), (a, b)} be a relation on a set A = {a, b, c}. Then, R is
a) Transitive ;
b) Reflexive ;
c) Symmetric ;
d) None of these.

15. Let R = {(a, b), (b, c), (a, c)} be a relation on a set A = {a, b, c}. Then, R is
a) Neither reflexive nor transitive
b) Neither symmetric nor transitive
b) Neither symmetric nor transitive

- c) Transitive
- d) None of these.

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