

Math's Assignment XII

7-5-09

RELATION & FUNCTIONS

Q1. (i) Show that the relation R in the set $A = \{1, 2, 3, 4, 5\}$ given by $R = \{(a, b) : |a - b| \text{ is even}\}$, is an equivalence relation

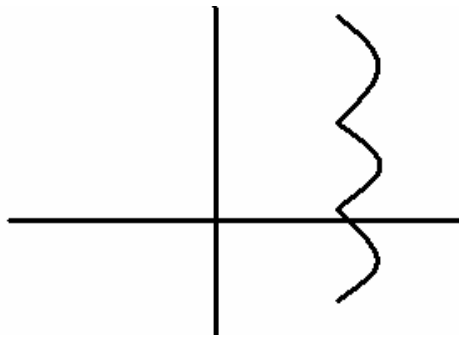
(ii) Show that the relation R in the set $A = \{x \in \mathbb{Z} : 0 \leq x \leq 12\}$ given by

(a) $R = \{(a, b) : |a - b| \text{ is a multiple of } 4\}$

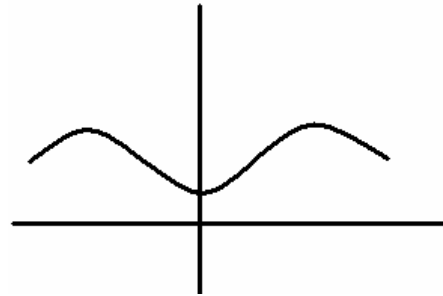
(b) $R = \{(a, b) : a = b\}$

C.B.S.E. 2008 sample paper

Q2. Which of the following graphs represent the function of x ? Why?



(A)



(B) **C.B.S.E. 2008**

Q3. Show that the relation in the set $A = \{x \mid x \in \mathbb{W}, 0 \leq x \leq 12\}$ given by $R = \{(a, b) : (a - b) \text{ is a multiple of } n\}$, also find the set of all elements related to 2? **CBSE 2007 I**

Q4. If R is the relation in $\mathbb{N} \times \mathbb{N}$ defined by $(a, b) R (c, d)$ if and only if $(a + d) = (b + c)$ show that the relation is an equivalence relation? **C.B.S.E. 2006 III**

Q5. If R is a relation in $\mathbb{N} \times \mathbb{N}$, show that the relation R is defined by $(a, b) R (c, d)$ if and only if $ad = bc$ is an equivalence relation? **CBSE 2006 I**

Q6. Construct a 2×2 matrix $A = [A_{ij}]$ whose elements are given by $a_{ij} = i + 2j$?
C.B.S.E. 1995

Q7. Construct a 2×2 matrix by $a_{ij} = (i - j)^2 / 2$?

C.B.S.E. 1996 I

Q8. Construct a matrix 2×2 given by $a_{ij} = \frac{1}{2}|2i - 3j|$?

C.B.S.E. 1996 III

Q9. Construct a 3×4 matrix given by $a_{ij} = 3i - j/2$?

C.B.S.E. 1999 II

Q10. Construct a 3×2 matrix given by $a_{ij} = (i+2j)^2/2$ **A.I.C.B.S.E .2002**

Q11. If $A = \begin{pmatrix} 2 & 2 \\ -3 & 1 \\ 4 & 0 \end{pmatrix}$, $B = \begin{pmatrix} 6 & 2 \\ 1 & 3 \\ 0 & 4 \end{pmatrix}$ find the matrix C such that $A+B+C$ is a zero matrix?
C.B.S.E. 1998

Q12. If $A = \begin{pmatrix} 1 & -3 & 2 \\ 2 & 0 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 2 & -1 & 1 \\ 1 & 0 & -1 \end{pmatrix}$ find the matrix C such that $A+B+C=0$ is zero matrix?
C.B.S.E .2000 I

Q13. If $A = \begin{pmatrix} 1 & 2 \\ -3 & 0 \\ 2 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 2 & 1 \\ -1 & 0 \\ 1 & -1 \end{pmatrix}$ find the matrix C such that $A+B+C=0$ is zero matrix?
C.B.S.E. 2001

Q14. Find the matrix x such that $2A+B+X=0$,
Where $A = \begin{pmatrix} -1 & 2 \\ 3 & 4 \end{pmatrix}$, $B = \begin{pmatrix} 3 & -2 \\ 1 & 5 \end{pmatrix}$
C.B.S.E. 2000

Q15. Find the values of x & y from the following equation:

$2 \begin{pmatrix} x & 5 \\ 7 & y-3 \end{pmatrix} + \begin{pmatrix} 3 & -4 \\ 1 & 2 \end{pmatrix} = \begin{pmatrix} 7 & 6 \\ 15 & 14 \end{pmatrix}$
C.B.S.E .sample paper 1997

Q16. Find X & Y if :

$X+Y = \begin{pmatrix} 7 & 0 \\ 2 & 5 \end{pmatrix}$ & $X-Y = \begin{pmatrix} 3 & 0 \\ 0 & 3 \end{pmatrix}$
C.B.S.E 1992 III

Q17. $3A-2B=0$ where:

$A = \begin{pmatrix} 4 & 2 \\ 1 & 3 \end{pmatrix}$ & $B = \begin{pmatrix} -2 & 1 \\ 3 & 2 \end{pmatrix}$
A.I.C.B.S.E. 2000 I

Q18. $3X+Y = \begin{pmatrix} 2 & -1 \\ 3 & 1 \end{pmatrix}$ & $X+4Y = \begin{pmatrix} 0 & 3 \\ 2 & 1 \end{pmatrix}$
C.B.S.E 2006

Q19. Write as a single matrix:

$$\begin{pmatrix} 3 & 2 & 5 \\ 7 & -4 & 0 \end{pmatrix} \begin{pmatrix} 1 & 2 \\ 2 & -1 \\ 3 & 5 \end{pmatrix} - \begin{pmatrix} 7 & -8 \\ 5 & 9 \end{pmatrix}$$

C.B.S.E 1993 III

Q20. Find matrix A^2 if :

$$A = \begin{pmatrix} \cos 2\theta & \sin 2\theta \\ -\sin 2\theta & \cos 2\theta \end{pmatrix}$$

C.B.S.E. 1991 II

Q21 . Let $A = \begin{pmatrix} 3 & 4 \\ -4 & 3 \end{pmatrix}$ find $f(a)$ if $f(x) = x^2 - 5x + 7$.

C.B.S.E. 2004

Q22. $A = \begin{pmatrix} \cos \theta & \sin \theta \\ -\sin \theta & \cos \theta \end{pmatrix}$ Prove that:

CBSE 2003 II

$$A^n = \begin{pmatrix} \cos n\theta & \sin n\theta \\ -\sin n\theta & \cos n\theta \end{pmatrix}, n \in \mathbb{N}.$$

