

$$M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

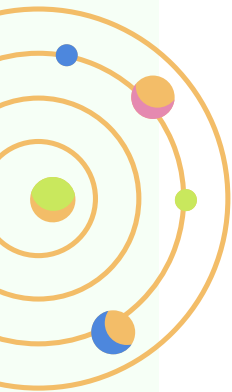
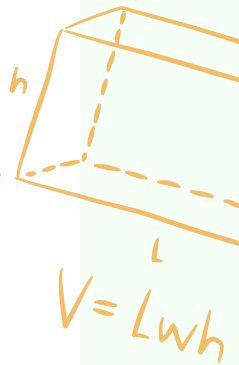
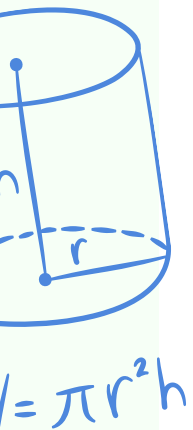


# HOLIDAY HOMEWORK

CLASS: 12TH  
MATHEMATICS

SCERT, PUNJAB

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



## Holiday Homework

**Q1** Choose the correct option in the following questions :

- (i) Relation  $R = \{(11, 11), (12, 12), (11, 12), (12, 11)\}$  defined on the set  $A = \{11, 12\}$  is :  
 (a) Only Reflexive relation (b) Only Symmetric relation  
 (c) Only Transitive relation (d) Equivalence relation
- (ii) Which of the following relations defined on set  $A = \{1, 2, 3\}$  is reflexive but neither symmetric nor transitive :  
 (a)  $R = \{(1, 1), (2, 2), (3, 3)\}$  (b)  $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3)\}$   
 (c)  $R = \{(1, 2), (1, 3), (2, 3), (3, 1), (2, 1)\}$  (d)  $R = \{(1, 2), (2, 3), (1, 3), (2, 1)\}$
- (iii) Function defined by  $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = x^3$  is :  
 (a) only one-one (b) only onto  
 (c) one-one and onto (d) neither one-one nor onto
- (iv) If  $A = \{1, 4, 9, 16, 25, \dots\}$  then function defined by  $f : \mathbb{Z} \rightarrow A, f(x) = x^2$  is  
 (a) only one-one (b) only onto  
 (c) one-one and onto (d) neither one-one nor onto
- (v) Relation  $R = \{(x, y) : x < y^2 \text{ where } x, y \in \mathbb{R}\}$  is  
 (a) Reflexive but not symmetric (b) Symmetric and transitive but not Reflexive  
 (c) Reflexive and Symmetric (d) Neither reflexive nor symmetric nor transitive
- (vi) Function  $f : \mathbb{R} \rightarrow \mathbb{R}, f(x) = \frac{3-7x}{2}$  is:  
 (a) one-one but not onto (b) onto but not one-one  
 (c) one-one and onto (d) neither one-one nor onto
- (vii)  $\cos^{-1}(0)$  is equal to :  
 (a) 0 (b)  $\frac{\pi}{6}$  (c)  $\frac{\pi}{2}$  (d)  $\frac{\pi}{3}$
- (viii)  $\tan^{-1}(1)$  is equal to :  
 (a)  $\frac{\pi}{4}$  (b)  $\frac{\pi}{6}$  (c)  $\frac{\pi}{2}$  (d)  $\frac{\pi}{3}$
- (ix) If  $y = \sin^{-1}(x)$  then  $x$  belongs to the interval :  
 (a)  $(0, \pi)$  (b)  $(-1, 1)$  (c)  $[-1, 1]$  (d)  $[0, \pi]$
- (x)  $\sin^{-1}\left(\sin\frac{\pi}{3}\right)$  is equal to :  
 (a)  $\frac{\pi}{5}$  (b)  $\frac{2\pi}{3}$  (c)  $\frac{\pi}{2}$  (d)  $\frac{\pi}{3}$
- (xi) If order of matrix  $A$  is  $2 \times 3$  and order of matrix  $B$  is  $3 \times 5$  then order of matrix  $B'A'$  is :  
 (a)  $5 \times 2$  (b)  $2 \times 5$  (c)  $5 \times 3$  (d)  $3 \times 2$
- (xii) If  $\begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix} = \begin{vmatrix} 2 & 0 \\ 8 & 4 \end{vmatrix}$  then value of  $x$  is :  
 (a) 3 (b) 2 (c) 4 (d) 8
- (xiii) If  $\begin{bmatrix} 2x+y & 0 \\ 5 & x \end{bmatrix} = \begin{bmatrix} 5 & 0 \\ 5 & 3 \end{bmatrix}$ , then  $y$  is equal to:-  
 (a) 1 (b) 3 (c) 2 (d) -1
- (xiv) If  $A B = C$  where  $B$  and  $C$  are matrices of order  $2 \times 5$  and  $5 \times 5$  respectively then order of  $A$  is :-  
 (a)  $5 \times 5$  (b)  $5 \times 2$  (c)  $2 \times 5$  (d)  $2 \times 2$
- (xv) If  $A = \begin{bmatrix} 2 & 5 \\ 1 & -2 \end{bmatrix}$  then  $|A|$  is  
 (a) -9 (b) 9 (c) 1 (d) -1
- (xvi) If  $A$  is a matrix of order of  $3 \times 3$  and  $|A| = 3$  then  $|Adj(A)|$  is  
 (a) 81 (b) 9 (c) 27 (d) 3

Q2 Check reflexivity, symmetry and transitivity for the following relations :

(i)  $R = \{(x, y) : x \leq y^2, x, y \in \mathbb{R}\}$

(ii)  $R = \{(l_1, l_2) : l_1 \text{ is parallel to } l_2\}$  defined on the set of all lines  $L$  on a plane.

Q3 For the following functions  $f : \mathbb{R} \rightarrow \mathbb{R}$  :

(i)  $f(x) = \frac{3x+5}{2}$

(ii)  $f(x) = \frac{2x-7}{4}$

show that these functions are one-one and onto.

Q4 Find the values of :

(i)  $7 \cos^{-1}\left(\frac{1}{2}\right) + 12 \tan^{-1}(1) - 4 \sin^{-1}(-1)$

(ii)  $5 \cos^{-1}\left(\frac{\sqrt{3}}{2}\right) - 3 \tan^{-1}(\sqrt{3}) + 7 \sin^{-1}\left(\frac{1}{2}\right)$

Q5 If  $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$ , then verify  $A^2 - 7A - 2I = 0$ .

Q6 If  $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$  and  $f(x) = x^2 - 2x - 3$  then find  $f(A)$ .

Q7 If  $A = \begin{bmatrix} 1 & 0 \\ -1 & 7 \end{bmatrix}$  and  $A^2 - 8A = kI$  then find  $k$ .

Q8 Verify  $(AB)' = B'A'$  for the following matrices :

(i)  $A = \begin{bmatrix} 1 \\ 3 \\ 6 \end{bmatrix}$ ,  $B = [2 \quad 4 \quad 5]$

(ii)  $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & 1 & 0 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -1 \\ 0 & 2 \\ 5 & 0 \end{bmatrix}$

Q9 Find the value of  $x$  if  $(3, -2)$ ,  $(x, 2)$  and  $(8, 8)$  are collinear points.

Q10 Using determinants, find the value of  $k$  if the area of the triangle formed by the points

$(-3, 6)$ ,  $(-4, 4)$  and  $(k, -2)$  is 12 sq. units.

Q11 Solve the following system of linear equations by matrix method :

(i)  $2x + 3y + 3z = 5$ ,  $x - 2y + z = -4$ ,  $3x - y - 2z = 3$

(ii)  $5x + y - z = -6$ ,  $2x - 3y + 4z = 3$ ,  $7x + y - 3z = -12$

Q12 Express the following matrices as a sum of a symmetric matrix and a skew-symmetric matrix :

(i)  $\begin{bmatrix} 2 & 0 & 3 \\ -1 & 4 & 8 \\ 7 & 2 & 9 \end{bmatrix}$

(ii)  $\begin{bmatrix} 3 & 6 & 2 \\ 0 & 7 & 8 \\ 5 & 1 & 9 \end{bmatrix}$

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Class 12

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2. **Students** are requested to **log in to Khan Academy** before using these links.
3. Links will be updated by 26th May, 24