

## CLASS XII MATHEMATICS IMPORTANT QUESTIONS

VSA

1. Give an example to show that the relation R in the set of real numbers given as  $R = \{(a,b) : a \leq b^2\}$  is not transitive.
2. Define when a relation R in set A is symmetric.
3. If  $f(x) = \frac{2x+3}{4}$  is invertible, find  $f^{-1}$ .
4. If  $f(x) = 2x+3$  and  $g(x) = x^2 + 1$ , find  $g \circ f(x)$ .
3. Show that  $f: \mathbb{R} \rightarrow \mathbb{R}$ , given by  $f(x) = 4x+3$  is invertible. Find  $f^{-1}$ .
4. Consider  $f: \mathbb{R}_+ \rightarrow [5, \infty)$  given by  $f(x) = 9x^2 + 6x - 5$ . Show that f is invertible with  $f^{-1}(y) = \left( \frac{\sqrt{y+6} - 1}{3} \right)$ .

5. Find if  $*$   $(a,b) = \frac{ab}{5}$ , is (i) commutative (ii) associative. Also find identity element of  $*$  (if any)

6 Prove that  $2 \tan^{-1} \frac{1}{2} + \tan^{-1} \frac{1}{7} = \tan^{-1} \frac{31}{17}$

7. Solve  $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$ .

5. If  $*$   $(a,b) = 2a + 3b^2$ ,  $a, b \in \mathbb{N}$ , find  $1 * 4$ .

6 Write the range of the Principal branch of the function  $\operatorname{cosec}^{-1}$ .

7. Write the value of (i)  $\cos^{-1}(-\frac{1}{2})$  (ii)  $\cos^{-1}(\cos \frac{9\pi}{5})$ .

SA

1. Check whether the relation R in the set of real numbers, defined as  $R = \{(a,b) : a \leq b^3\}$  is reflexive, symmetric or transitive.
2. Show that the relation R in set  $A = \{1, 2, 3, \dots, 9\}$  given by  $R = \{(p,q) : |p-q| \text{ is even}\}$  is an equivalence relation

3. Find  $A^{-1}$ , using elementary operations if  $A = \begin{pmatrix} 1 & 2 \\ 2 & -1 \end{pmatrix}$ .

VSA

1. If  $A = \begin{pmatrix} 3 & 4 & 7 \\ 2 & 4 & 6 \end{pmatrix}$ , write  $A'$ .

2. If  $B = \begin{pmatrix} a & b & c & d \end{pmatrix}$ , write  $BB'$ .

3. If  $\begin{pmatrix} 2x-y & 3 \\ 4 & 2y \end{pmatrix} = \begin{pmatrix} 1 & 3 \\ 4 & 6 \end{pmatrix}$ , find x.

4. If  $\begin{vmatrix} 2x & 3 \\ 4 & x \end{vmatrix} = \begin{vmatrix} 3 & 3 \\ 4 & 6 \end{vmatrix}$ , find the value of x

4. Using properties of determinants, show  $\begin{vmatrix} 1 & x & x^2 \\ x^2 & 1 & x \\ x & x^2 & 1 \end{vmatrix} = (1-x^3)^2$ .

5. If  $A = \begin{pmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{pmatrix}$ , verify that  $A \cdot \operatorname{adj} A = |A| I$ . Also find  $A^{-1}$ .

LA

1. Using matrix method, solve:  $2x + 3y + 3z = 5$ ,  $x - 2y + z = -4$ ,  $3x - y - 2z = 3$ .
2. Find the inverse of a  $3 \times 3$  matrix by elementary operations.