MATHS

BOOKS - VGS PUBLICATION-BRILLIANT

MATHEMATICS -I(A) MODEL PAPER 4

Section A

1. Find the domain of the real function $f(x) = \sqrt{x^2 - 25}$

Watch Video Solution

2. IF $f: R \to R, g: R \to R$ are defined by $f(x) = 3x - 1$ and $g(x) = x^2 + 1$, then find (fog)(2)

Watch Video Solution

3. Define a symmetric matrix. Give one example of order 3×3

Watch Video Solution

4. Find the inverse of the matrix $\begin{bmatrix} 1 & 2 \\ -3 & -5 \end{bmatrix}$.

Watch Video Solution

5. If vectors $-3\bar{i}+4\bar{j}+\lambda\bar{k}, \mu\bar{i}+8\bar{j}+6\bar{k}$ are collinear vectors then find $\lambda \& \mu$.

Watch Video Solution

6. Find the vector equation of plane passing through Points (0,0,0) , (0,5,0) and (2,0,1)

Watch Video Solution

7. Find the angle between the vectors $\bar{i}+2\bar{j}+3\bar{k}$ and $3\bar{i}-\bar{j}+2\bar{k}$.

Watch Video Solution

8. Find $\sin 330^\circ . \cos 120^\circ + \cos 210^\circ . \sin 300^\circ$

Watch Video Solution

9. Find the extreme values of $\cos 2x + \cos^2 x$

Watch Video Solution

Section B

1. IF $A = \begin{bmatrix} 7 & -2 \\ -1 & 2 \\ 5 & 3 \end{bmatrix}, B = \begin{bmatrix} -2 & -1 \\ 4 & 2 \\ -1 & 0 \end{bmatrix}$ then find AB' and BA'

Watch Video Solution

2. $\bar{a}, \bar{b}, \bar{c}$ are non coplanar vectors. Prove that the four points $-\bar{a}+4\bar{b}-3\bar{c}$, $3\bar{a}+2\bar{b}-5\bar{c}$, $-3\bar{a}+8\bar{b}-5\bar{c}$, $-3\bar{a}+2\bar{b}+\bar{c}$ are co-planar.

Watch Video Solution

3. Let $\bar{a}$ and $\bar{b}$ be vectors,satisfying $|\bar{a}|=|\bar{b}|=5$ and $(\bar{a}, \bar{b})=45^{\circ}$. Find the area of the triangle having $\bar{a}-2\bar{b}$ and $3\bar{a}+2\bar{b}$ as two of its sides.

Watch Video Solution

4. If A is not an integral multiple of $\frac{\pi}{2}$, prove that

(i) $\tan A+\cot A=2\cos ec2A$

(ii) cot A - tan A = 2cot 2A`

Watch Video Solution

5. Solve the following equations

$\sqrt{3}\sin\theta - \cos\theta = \sqrt{2}$

Watch Video Solution

6. $\sin^{-1}\left(\frac{4}{5}\right) + \sin^{-1}\left(\frac{5}{13}\right) + \sin^{-1}\left(\frac{16}{65}\right) =$

Watch Video Solution

7. If $a = (b-c)\sec\theta$, then prove that $\tan\theta = \frac{2\sqrt{bc}}{b-c}\frac{\sin A}{2}$.

Watch Video Solution

Section C

1. If $f: A \to B, g: B \to C$ are two bijective functions then prove that $gof: A \to C$ is also a bijective function.

Watch Video Solution

2.

$$\lim_{n \to \infty} \left\{ \frac{1}{1.3} + \frac{1}{3.5} + \frac{1}{5.7} + \ldots . + \frac{1}{(2n-1)(2n+1)} \right\} =$$

Watch Video Solution

3. Show that

$$\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$$

Watch Video Solution

4. solve the following system of equations by using Matrix inversion method.

$2x - y + 3z = 9, x + y + z = 6, x - y + z = 2.$

Watch Video Solution

5. Show that

i) $\bar{a} \times \left(\bar{a} \times \left(\bar{a} \times \bar{b}\right)\right) = (\bar{a}.\,\bar{a})\left(\bar{b} \times \bar{a}\right)$

ii) $\left\{\left(\bar{a} \times \bar{b}\right) \times (\bar{a} \times \bar{c})\right\}.\,\bar{d} = \left(\bar{a}.\,\bar{d}\right)\left[\bar{a}\bar{b}\bar{c}\right]$

Watch Video Solution

6. If A,B,C are angles in a triangle , then prove that $\cos A + \cos B + \cos C = 1 + 4 \sin. \frac{A}{2} \sin. \frac{B}{2} \sin. \frac{C}{2}$

Watch Video Solution

7. Show that $r + r_3 + r_1 - r_2 = 4R \cos B.$

Watch Video Solution