MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

SOLVED MODEL PAPER -3

Section A

1. Find the inverse of the real function of $f(x) = ax + b, a \neq 0$.

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2. Find the domain of the real function

$$f(x) = \frac{1}{\sqrt{1 - x^2}}$$

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3. if $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 8 \\ 7 & 2 \end{bmatrix}$ and 2X+A=B then find X

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4. Find the cofactors of 2 and -5 in the matrix

$$\begin{bmatrix} -1 & 0 & 5 \\ 1 & 2 & -2 \\ -4 & -5 & 3 \end{bmatrix}$$

5. Show that the points

$$A(2\bar{i} - \bar{j} + \bar{k}), B(\bar{i} - 3\bar{j} - 5\bar{k}), C(3\bar{i} - 4\bar{j} - 4\bar{k})$$

are the vertices of a right angled triangle.

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

7. If $\bar{a} = \bar{i} + \bar{j} + \bar{k}, \bar{b} = 2\bar{i} + 3\bar{j} + \bar{k}$ then find the projection vector of $\bar{b}$ on $\bar{a}$ and its magnitude.

8. Eliminate $'\theta'$ from $x = a\cos^3\theta, y = b\sin^3\theta$.
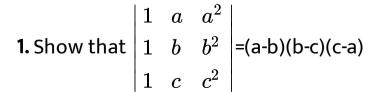
9. Find a cosine function whose period is 7.

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10. Prove that $\cosh^2 x - \sinh^2 x = 1$

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Section B

1. Show that $\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix}$ =(a-b)(b-c)(c-a)

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2. Find λ in order that the four points $A(3, 2, 1)$, $B(4, \lambda, 5)$, $C(4, 2, -2)$ and $D(6, 5, -1)$ be coplanar.

3. Show that $\dfrac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1} = \dfrac{1 + \sin\theta}{\cos\theta}$

4. Solve $2\cos^2\theta + 11\sin\theta = 7$.

5. Find the value of $\tan\left(\dfrac{\sin^{-1}3}{5} + \dfrac{\cos^{-1}5}{\sqrt{34}}\right)$.

6. If $C = 60°,$ then show that $\dfrac{a}{b+c} + \dfrac{b}{c+a} = 1$

Section C

1. If $f : A \rightarrow B$ is a function and I_A, I_B are identify functions on A,B respectively then prove that $f o I_A = f = I_B$ of

2. By Mathematical Induction , show that $49^n + 16n - 1$ is divisible by 64 for all positive Integer n .

3. If A is a non-singular matrix then prove that $A^{-1} = \dfrac{adjA}{|A|}$.

4. Solve the system of equations by Matrix inverse method,

$$2x - y + 3z = 8, \quad -x + 2y + z = 4, \quad 3x + y - 4z = 0$$

5. Fo any four vectors $\bar{a}, \bar{b}, \bar{c}$ and $\bar{d}$, prove that

(i) $(\bar{a} \times \bar{b}) \times (\bar{c} \times \bar{d}) = [\overline{acd}]\bar{b} - [\overline{bcd}]\bar{a}$ and (ii)

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

6. IF A,B,C are angles in the triangle, then prove that

$$\cos A + \cos B - \cos C = -1 + 4\cos\frac{A}{2}.\cos\frac{B}{2}.\sin\frac{C}{2}$$

7. If $a = (b-c)\sec\theta$, then prove that

$$\tan\theta = \frac{2\sqrt{bc}}{b-c}\frac{\sin A}{2}.$$