



MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE: MARCH-2016 [TS]

Section A Vsaq

1. If $A = \{-2, -1, 0, 1, 2\}$ and $f: A \rightarrow B$ is a surjection defined by $f(x) = x^2 + x + 1$ then find B.

 [Watch Video Solution](#)

2. Find the domain of the real function $\log(x^2 - 4x + 3)$

 [Watch Video Solution](#)

3. Solve the following system of homogenous equations

$$x + y + z = 0, x + 2y - z = 0, 2x + y + 3z = 0.$$

 [Watch Video Solution](#)

4. Defind Triangular Matrix.

 [Watch Video Solution](#)

5. Let $\bar{a} = \bar{i} + 2\bar{j} + 3\bar{k}$ and $\bar{b} = 3\bar{i} + \bar{j}$. Find the unit vector in the direction of $\bar{a} + \bar{b}$.

 [Watch Video Solution](#)

6. Find the vector equation of the line passing through the points $2\bar{i} + \bar{j} + 3\bar{k}$ and $-4\bar{i} + 3\bar{j} - \bar{k}$.

 [Watch Video Solution](#)

7. If the vectors $\lambda\bar{i} - 3\bar{j} + 5\bar{k}$, and $2\lambda\bar{i} - \lambda(j) - \bar{k}$, are perpendicular to each other find λ .

 [Watch Video Solution](#)

8. If $A + B = \frac{\pi}{4}$, then prove that $(1 + \tan A)(1 + \tan B) = 2$.

 [Watch Video Solution](#)

9. Eliminate ' θ ' from $x = a \cos^3 \theta$, $y = b \sin^3 \theta$.

 [Watch Video Solution](#)

10. If $\sin hx = 3$, then show that $x = \log_e(3 + \sqrt{10})$.

 [Watch Video Solution](#)

1. If $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $E = \begin{bmatrix} 0 & 1 \\ 0 & 0 \end{bmatrix}$ then show that $(aI + bE)^3 = a^3I + 3a^2bE$ where I is identify matrix of order 2.

 [Watch Video Solution](#)

2. Show that the line joining the pair of points $6\bar{a} - 4\bar{b} + 4\bar{c}$, $-4\bar{c}$ and the line joining the pair of points, $-\bar{a} - 2\bar{b} - 3\bar{c}$, $\bar{a} + 2\bar{b} - 5\bar{c}$ intersect at the point $-4\bar{c}$ when \bar{a} , \bar{b} , \bar{c} are non-coplanar vectors.

 [Watch Video Solution](#)

3. 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.

 [Watch Video Solution](#)

4. If none of the denominators is zero, prove that.

$$\left(\frac{\cos A + \cos B}{\sin A - \sin B}\right)^n + \left(\frac{\sin A - \sin B}{\cos A + \cos B}\right)^n = \begin{cases} 2 \cot^n\left(\frac{A-B}{2}\right) & \text{if } n \text{ is even} \\ 0 & \text{if } n \text{ is odd} \end{cases}$$



Watch Video Solution

5. If θ_1, θ_2 are solutions of the equation $a \cos 2\theta + b \sin 2\theta = c$, $\tan \theta_1 \neq \tan \theta_2$ and $a + c \neq 0$, then find the values of (i) $\tan \theta_1 + \tan \theta_2$ (ii) $\tan \theta_1 \cdot \tan \theta_2$.



Watch Video Solution

6. Prove that $\sin^{-1}\left(\frac{4}{5}\right) + \frac{\sin^{-1} 7}{25} = \frac{\sin^{-1} 117}{125}$.



Watch Video Solution

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

 [Watch Video Solution](#)

Section C Laq

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

 [Watch Video Solution](#)

2. Using Mathematical induction. For all $n \in \mathbb{N}$. Show that

$$a + (a + d) + (a + 2d) + \dots \text{upto } n \text{ terms} = \frac{n}{2}[2a + (n - 1)d]$$

 [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. If $\vec{a} = \vec{i} - 2\vec{j} + 3\vec{k}$, $\vec{b} = 2\vec{i} + \vec{j} + \vec{k}$, $\vec{c} = \vec{i} + \vec{j} + 2\vec{k}$ then find

$$|(\vec{a} \times \vec{b}) \times \vec{c}| \text{ and } |\vec{a} \times (\vec{b} \times \vec{c})|.$$

 [Watch Video Solution](#)

6. If $A + B + C = 2S$, then prove that

$$\sin(S - A) + \sin(S - B) + \sin C = 4 \cos\left(\frac{S - A}{2}\right) \cos\left(\frac{S - B}{2}\right) \frac{\sin C}{2}$$



Watch Video Solution

7. If $r_1 = 2, r_2 = 3, r_3 = 6$ and $r = 1$, prove that
 $a = 3, b = 4$ and $c = 5$.



Watch Video Solution