MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MAY-2018[AP]

Section A Vsaq

1. If $f: R - \{\pm 1\} \to R$ is defined by $f(x) = \log\left|\dfrac{1+x}{1-x}\right|$, then S.T $f\left(\dfrac{2x}{1+x^2}\right) = 2f(x)$

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

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3. If $A = \begin{bmatrix} 2 & -4 \\ -5 & 3 \end{bmatrix}$ then find $A + A'$ and AA'.

4. Find the rank of $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

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

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

7. If $\bar{a} = \bar{i} + 2\bar{j} - 3\bar{k}$, $\bar{b} = 2\bar{i} + 3\bar{j} + \bar{k}$ then Show that $\bar{a} + \bar{b}$, $\bar{a} - \bar{b}$ are perpendicular .

8. If $\sec\theta + \tan\theta = 2/3$, then value of $\sin\theta$ and determine the quadrant in which θ lies .

9. If A is not an intergral multiple of $\pi/2$, prove that

$\tan A + \cot A = 2\cosec2A$

10. If $\cosh x = 5/2$, then find the values of

$\cosh(2x)$

11. IF $\cosh x = 5/2$, then find the value of (i) cosh(2x) and (ii) sinh(2x)

Section B Saqs

1. $\theta - \varphi = \dfrac{\pi}{2}$ then show that

$$\begin{bmatrix} \cos^2\theta & \cos\theta\sin\theta \\ \cos\theta\sin\theta & \sin^2\theta \end{bmatrix} \begin{bmatrix} \cos^2\phi & \cos\phi\sin\phi \\ \cos\phi\sin\phi & \sin^2\phi \end{bmatrix} = O$$

2. If ABCDEF is a regular hexagon with centre O , then P.T

$$\overline{AB} + \overline{AC} + \overline{AD} + \overline{AE} + \overline{AF} = 3\overline{AD} = 6\overline{AO}$$

3. Let $\bar{a} = 4\bar{i} + 5\bar{j} - \bar{k}$, $\bar{b} - \bar{i} - 4\bar{j} + 5\bar{k}$ and $\bar{c} = 3\bar{i} + \bar{j} - \bar{k}$. Find the vector which is perpendicular to both $\bar{a}$ and $\bar{b}$ and $\bar{\alpha}.\bar{c} = 21$

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4. Prove that $\cos^2 76° + \cos^2 16° - \cos 76° \cos 16° = \dfrac{3}{4}$

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5. Solve that $\sqrt{2}(\sin x + \cos x) = \sqrt{3}$

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6. Show that $\cos\left(2\tan^{-1}.\dfrac{1}{7}\right) = \sin\left(2\tan^{-1}.\dfrac{3}{4}\right)$

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7. Show that $a^2 \cot A + b^2 \cot B + c^2 \cot C = \dfrac{abc}{R}$

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1. If $f: A \to B, g: B \to C$ are two bijective functions then P.T

$(\text{gof})^{-1} = f^{-1} \text{og}^{-1}$

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2. Using the principle of finite Mathematical Induction prove the following:

(v) $3.5^{2n+1} + 2^{3n+1}$ is divisible by 17, $\forall n \in N$.

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

4. $x+y+z = 1, 2x+2y+3z = 6, x+4y+9z = 3,$ by Gauss-Jordan method.

5. If

$\bar{a} = \bar{i} - 2\bar{j} - 3\bar{k}, \bar{b} = 2\bar{i} + \bar{j} - \bar{k}, \bar{c} = \bar{i} + 3\bar{j} - 2\bar{k}$ then find $\bar{a} \times (\bar{b} \times \bar{c})$

6. If A, B, C are angles of a triangle, then

$P.T \sin^2 . \dfrac{A}{2} + \sin^2 . \dfrac{B}{2} - \sin^2 . \dfrac{C}{2} = 1 - 2\cos . \dfrac{A}{2} \cos . \dfrac{B}{2} \sin . \dfrac{C}{2}$

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