MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MAY-2016(AP)

Questions

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

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2. Find the domain of the real function

$\log(x^2 - 4x + 3)$

3. IF $\begin{bmatrix} x-2 & 2y-8 \\ z+2 & 6 \end{bmatrix} = \begin{bmatrix} 5 & 2 \\ -2 & a-4 \end{bmatrix}$ then find the

values of z,y,z and a.

4. IF $A = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 3 & 4 \\ 5 & -6 & x \end{bmatrix}$ and det A=45 then find x.

5. IF $\bar{a} = 2\bar{i} + 5\bar{j} + \bar{k}, \bar{b} = 4\bar{i} + m\bar{j} + n\bar{k}$ are collinear vectors then find m,n.

6. Find the vectors equation of the line passing through the points

$$2\bar{i} + \bar{j} + 3\bar{k}, \ -4\bar{i} + 3\bar{j} - \bar{k}$$

7. Find the area of the parallelogram whose adjacent sides are

$$a = 2\bar{i} - 3\bar{j}, \bar{b} = 3\bar{i} - \bar{k}$$

8. Find the period of $\tan\left(x + 4x + 9x + \ldots\ldots + n^2 x\right)$

(n any positive integer)

9. Prove that $\tan 70° - \tan 20° = 2\tan 50°$.

10. IF $\sinh x = 5$, then S.T $x = \log_e\left(5 + \sqrt{26}\right)$

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

12. If ABCDEF is a regular hexagon with centre O , then

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

13. Find the equation of the plane passing through the point A=(2,3,-1),B=(4,5,2),C=(3,6,5).

14. Show that

$$\cos^4 \frac{\pi}{8} + \cos^4 \frac{3\pi}{8} + \cos^4 \frac{5\pi}{8} + \cos^4 \frac{7\pi}{8} = \frac{3}{2}$$

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15. Solve $4\cos^2 \theta + \sqrt{3} = 2(\sqrt{3} + 1)\cos \theta$

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16. $\sin^{-1}\left(\frac{4}{5}\right) + 2\tan^{-1}\frac{1}{3} =$

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17. Prove that $\cot A + \cot B + \cot C = \dfrac{a^2 + b^2 + c^2}{4\Delta}$

18. 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.

19. Using the principle of Mathematical Induction, Show that $49^n + 16n - 1$ is divisible by 64, $\forall n \in N$.

20. Show that $\begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 2\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$

21. Solve the system of equations

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

Gauss Jordan method.

22. Find the shortest distance between the skew lines.

$\bar{r} = (6\bar{i} + 2\bar{j} + 2\bar{k}) + t(\bar{i} - 2\bar{j} + 2\bar{k})$ and

$\bar{r} = (-4\bar{i} - \bar{k}) + s(3\bar{i} - 2\bar{j} - 2\bar{k})$

23. IF $A + B + C = \pi$, then P.T

$$\cos^2 \frac{A}{2} + \cos^2 \frac{B}{2} + \cos^2 \frac{C}{2} = 2\left(1 + \sin \frac{A}{2}\sin \frac{B}{2}\sin \frac{C}{2}\right)$$

24. In a $\triangle ABC$ if $a = 13, b = 14, c = 15$ then S.T

$$R = \frac{65}{8}, r = 4, r_1 = \frac{21}{2}, r_2 = 12, r_3 = 14.$$