

MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

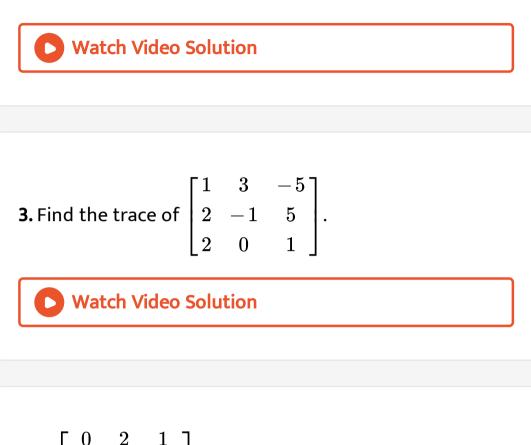
SOLVED MODEL PAPER-2



1. $f\!:\!R o R$ defined by $f(x)=rac{2x+1}{3}$, then this

function is injection or not? Justify.

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

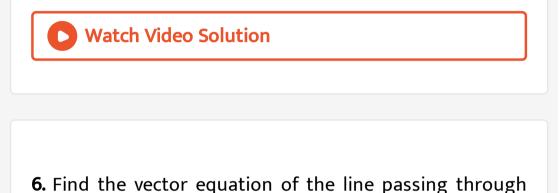


4. If
$$\begin{bmatrix} 0 & 2 & 1 \\ -2 & 0 & -2 \\ -1 & x & 0 \end{bmatrix}$$
 is a skew symmetric matrix then find

the value of x.



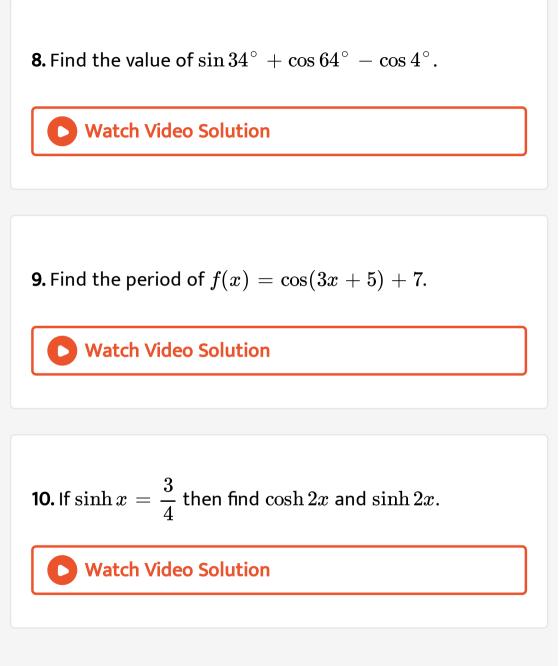
5. Show that the triangle formed by the vectors $3\overline{i} + 5\overline{j} + 2\overline{k}, 2\overline{i} - 3\overline{j} - 5\overline{k}, -5\overline{i} - 2\overline{j} + 3\overline{k}$ is equilateral.



the points $2\overline{i}+\overline{j}-3\overline{k} \, ext{ and } -4\overline{i}+3\overline{j}+\overline{k}.$

Watch Video Solution

7. If $\left|ar{a}+ar{b}
ight|=\left|ar{a}-ar{b}
ight|$ then find the angle between $ar{a}$ and $ar{b}$.



Section **B**

1. Show that the matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ 3 & 2 & 3 \\ 1 & 1 & 2 \end{bmatrix}$ is non-singular

and find A^{-1} .

Watch Video Solution

2. If the point whose position vectors are $3\overline{i} - 2\overline{j} - \overline{k}, 2\overline{i} + 3\overline{j} - 4\overline{k}, \overline{i} + \overline{j} - 2\overline{k}, 4\overline{i}5\overline{j} + \lambda\overline{k}$ are coplanar, then show that $\lambda = -\frac{46}{7}$.

Watch Video Solution

3. For any two vectors $ar{a} \, ext{ and } \, ar{b}$, show that

$${\left({1 + {\left| {ar a}
ight|}^2 }
ight)} \left({1 + {\left| {ar b}
ight|}^2 }
ight) = {\left| {1 - ar a.\,ar b}
ight|^2 + {\left| {ar a + ar b + ar a imes ar b}
ight|^2 }$$

4. Show that
$$\sin \frac{\pi}{5} \cdot \sin \frac{2\pi}{5} \cdot \sin \frac{3\pi}{5} \cdot \sin \frac{4\pi}{5} = \frac{5}{16}$$
.

Watch Video Solution

5. If
$$0 < x < rac{\pi}{2}$$
 then solve $\cot^2 x - ig(\sqrt{3}+1ig) \cot x + \sqrt{3} = 0$

Watch Video Solution

6. Prove that
$$2\sin^{-1}\left(rac{3}{5}
ight) - \cos^{-1}rac{5}{13} = \cos^{-1}\left(rac{323}{325}
ight).$$

Watch Video Solution

D

7. If
$$\frac{\cot A}{2}$$
: $\cot \frac{B}{2}$: $\cot \frac{C}{2} = 3:5:7$ then show that $a:b:c = 6:5:4.$



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.



2. Using the principle of finite Mathematical Indcution

prove that



3. Show that
$$\begin{vmatrix} 1 & a^2 & a^3 \\ 1 & b^2 & b^3 \\ 1 & c^2 & c^3 \end{vmatrix}$$
 =(a-b)(b-c)(c-a)(ab+bc+ca)

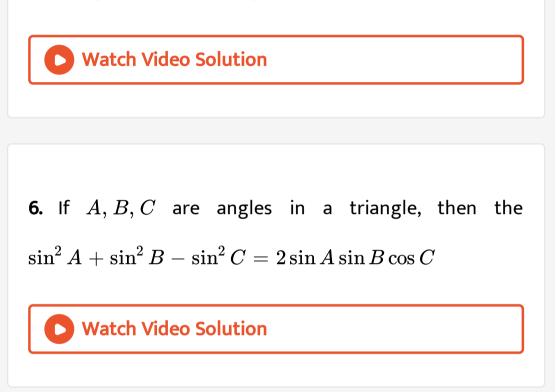
Watch Video Solution

4. Solve the following system of equations by using Cramer's rule.

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

5. P.T the smaller angle θ between any two diagonals of a

cube is given by $\cos heta=1/3$



7. In
$$riangle ABC$$
 prove that $rac{r_1}{bc}+rac{r_2}{ca}+rac{r_3}{ab}=rac{1}{r}-rac{1}{2R}.$

1. Transform the equation of x+y+1=0 into

Normal form

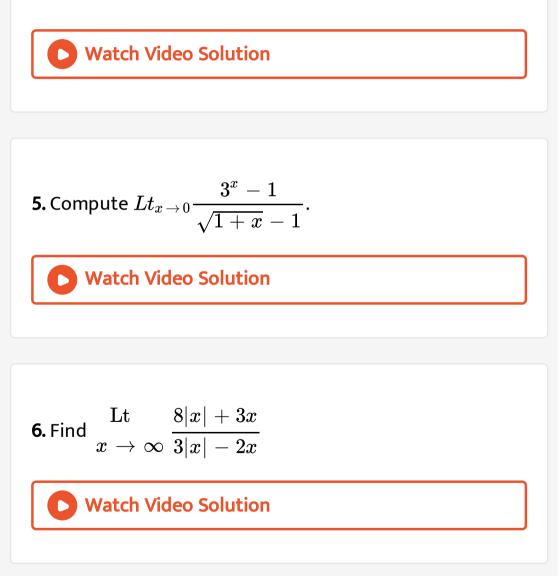
Watch Video Solution

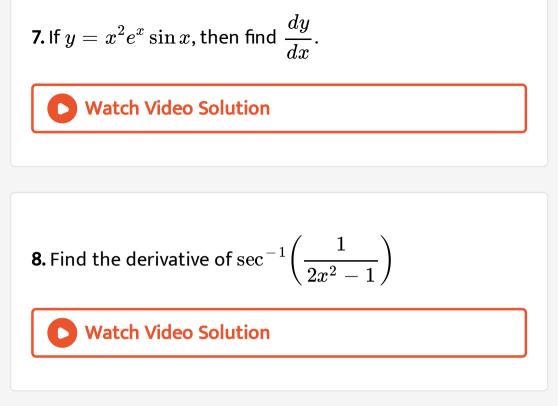
2. Evaluate
$$Lt_{x o 0}([x]+x)$$

Watch Video Solution

3. Show that the points
$$A(3, -2, 4), B(1, 1, 1), C(-1, 4, -2)$$
 are collinear.

4. Reduce the equation 4x - 4y + 2z + 5 = 0 of the plane to the intercept form.



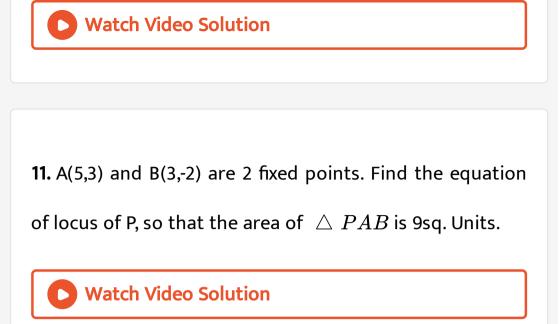


9. The side of a square is increased from 3 cm to 3.01 cm.

Find the approximate increase in the area of the square.



10. Verify Rolle's theroem for the function x^2-1 on [-1,1]`.



```
12. Prove that the angle of rotation of the axes to
eliminate xy term from the equation
ax^2 + 2hxy + by^2 = 0 is \tan^{-1}\left(\frac{2h}{a-b}\right) where
a \neq b and \frac{\pi}{4} if a = b.
```

13. Find the image of (1,2) in the straight line

3x + 4y - 1 = 0

Watch Video Solution

14. Show that
$$f(x) = \begin{cases} rac{\cos ax - \cos bx}{x^2} & ext{if } x \neq 0 \\ rac{1}{2} \left(b^2 - a^2
ight) & ext{if } x = 0 \end{cases}$$
 is continuous at 0

Watch Video Solution

15. Find the derivative of $\cot x$ from the first principle.

16. A particle moving along a straight line has the relation $s = t^3 + 2t + 3$, connecting the distance s describe by the particle in time t. Find the velocity and acceleration of the particle at t=4 sec.



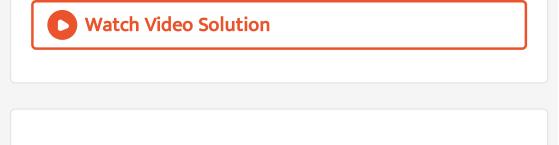
17. Find the equations of the tangent and the normal to

the curve $y=x^3+4x^2$ at (-1,3)

Watch Video Solution

18. Find the circumcentre of the triangle whose vertices

are (1,3) (0,-2) and (-3,1).



19. Find the centroid and the area of the triangle formed

by the lines $2y^2-xy-6x^2=0,\,x+y+4=0$



20. Write down the equation of the pair of straight lines joining the origin to the points of intersection of the 6x - y + 8 = 0 with the pair of straight lines $3x^2 + 4xy - 4y^2 - 11x + 2y + 6 = 0$. Show that the lines so obtained make equal angles with the coordinates axes.

21. Find the angle between the lines whose d.c's are related by $l + m + n = 0 \& l^2 + m^2 - n^2 = 0$

Watch Video Solution

22. Find the derivative of $(\sin x)^{\log x} + x^{\sin x}$.

Watch Video Solution

23. IF the tangent at any point P on the curve $x^my^n=a^{m+n},mn
eq 0$ meets the coordinate axes in A.B then show that $AP\colon BP$ is a constant.



24. Show that when the curved surface of a is right circular cylinder inscribed in a sphere of radius R is maximum, then the height of the cylinder is $\sqrt{2R}$.

