MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

SOLVED MODEL PAPER - 6

Section A

1. Find the equation of the line perpendicular to the line $3x + 4y + 6 = 0$ and making

intercept -4 on X-axis.

2. If the product of the intercepts make by the

straight   line

$x \tan \alpha + y \sec \alpha = 1, \left(0 \leq \alpha < \dfrac{\pi}{2}\right)$, on the

co-ordinates axes is equal to $\sin \alpha$, find α.

3. If $M(\alpha, \beta, \gamma)$ is the mid point of the line segment joining the points $A(x_1, y_1, z_1)$ and B then find B.

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4. Find the equation of the plane passing through the point (2,3,4) and perpendicular to the x-axis.

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5. Find $\displaystyle \mathop{\mathrm{Lt}}_{x \to a} \left(\frac{x \sin a - a \sin x}{x - a} \right)$

6. Find $\displaystyle \mathop{\mathrm{Lt}}_{x \to 0} \frac{\sin(a + bx) - \sin(a - bx)}{x}$

7. Find the derivative of $\log\left(\dfrac{x^2 + x + 2}{x^2 - x + 2} \right)$ w.r.to x.

8. If $y = \left(\cot^{-1} x^3 \right)^2$ then find $\dfrac{dy}{dx}$.

9. Find the approximate value of $\sqrt[4]{17}$

Section B

1. Find the equation of locus of a point which is at a distance 5 from A (4, - 3).

2. When the origin is shifted to (-1,2) by the translation of axes, find the transformed equation of $2x^2 + y^2 - 4x + 4y = 0$

3. $(-4, 5)$ is a vertex of a square and one of its diagonals is $7x - y + 8 = 0$. Find the equation of a the other diagonal.

4. Evaluate $\underset{x \to \infty}{\text{Lt}} \dfrac{x^2 - \sin x}{x^2 - 2}$

5. Using first principle, find the derivative of $\log_e x$ where $x \in (0, \infty)$.

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6. The volume of a cube is increasing at a rate of 8 cubie centimeters per second. How fast is the surface area increasing when the length of the edge is 12 cm?

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7. Find the equations of tangent and normal to the curve xy = 10 at (2 , 5)

Section C

1. The base of an equilateral triangle x + y = 2 = 0 and opposite vertex is (2 , - 1). Find the equations of the remaining sides .

2. Show that the lines

$(x + 2a)^2 - 3y^2 = 0$, $x = a$ form an

equilateral triangle.

3. Show that the following equations

represents a pair of parallel lines and also find

the distance between them.

Show that the equation

$8x^2 - 24xy + 18y^2 - 6x + 9y - 5 = 0$

represents a pair of parallel lines and find the distance between them.

4. If $(l_1, m_1, n_1), (l_2, m_2, n_2)$ are d.c.s of two intersecting lines, show that d.c.s of two lines bisecting the angles between them are proportional to $l_1 + l_2, m_1 + m_2, n_1 + n_2$.

5. Show that the derivatives of

$$\sin^{-1}\sqrt{\frac{x-\beta}{\alpha-\beta}}\tan^{-1}\sqrt{\frac{x-\beta}{\alpha-x}} \text{ are equal }.$$

6. Find the length of subtangent, subnormal at

a point on the curve

x=a(cost+sint), y=a(sint-tcost)

7. Find two positive integers whose sum is 16 and the sum of squares is minimum.