



MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

SOLVED MODEL PAPER -5

Section A

1. Find the ratio in which the straight line $2x + 3y - 5 = 0$ divides the line joining the points $(0,0)$ and $(-2,1)$.

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2. Find the equation of the straight lines passing through (x_0, y_0) parallel



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3. Find the equation of the straight lines passing through $(x_0 \ y_0)$ perpendicular to the straight line $ax + by + c = 0$

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4. Find the distance between the mid point of the line segment \overline{AB} and the point $(3, -1, 2)$ where $A = (6,3,-4)$, $B = (-2,-1,2)$.

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5. Find the equation of the plane through $(-1,6,2)$ are perpendicular to the join of $(1,2,3)$ and $(-2,3,4)$.

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6. Evaluate $\lim_{x \rightarrow 1} \frac{\sin(x-1)}{x^2-1}$

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7. Show that :

$$\lim_{x \rightarrow a} \frac{\sqrt{a+2x} - \sqrt{3x}}{\sqrt{3a+x} - 2\sqrt{x}} = \frac{2}{3\sqrt{3}}$$

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8. Find the derivative of $\cos^{-1}(4x^3 - 3x)$ w.r.to x .

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9. If $y = \tan^{-1}(\sin \sqrt{x}) + \operatorname{cosec}^{-1}(e^{2x+1})$, then $\frac{dy}{dx} =$

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10. The diameter of a sphere is measured to be 40 cm. If an error of 0.02 cm is made in it, then find approximate errors in volume and surface area of the sphere.

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11. Verify mean value theorem for the function $f(x) = x^2$ on $[2,4]$

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Section B

1. Find the equation of locus of a point, the sum of whose distances from $(0, 2)$ and $(0, -2)$ is 6.

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2. Find the incentre of the triangle whose vertices are $(1, \sqrt{3})$, $(2, 0)$ and $(0, 0)$

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3. Show that $f(x) = \sin x$ is continuous on \mathbb{R} .

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4. Find the derivative of $ax^2 + bx + c$ from the first principle.

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5. The radius of a circle is increasing at the rate of 0.7 cm/s. What is the rate of increase of its circumference?

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6. Find the value of k , so that the length of the subnormal at any point on the curve $xy^k = a^{k+1}$ is a constant.

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Section C

1. Find the area of the parallelogram whose sides are $3x + 4y + 5 = 0$, $3x + 4y - 2 = 0$, $2x + 3y + 1 = 0$, $2x + 3y - 7 = 0$

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2. If θ is the angle between the pair of lines $ax^2 + 2hxy + by^2 = 0$

then prove that $\cos \theta = \frac{a + b}{\sqrt{(a - b)^2 + 4h^2}}$

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3. Show that the straight line

$y^2 - 4y + 3 = 0$ and $x^2 + 4xy + 4y^2 + 5x + 10y + 4 = 0$ form a parallelogram and find the length of its sides.

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4. Find the direction cosines of the two lines which are connected by the relations $l + m + n = 0$ and $mn - 2nl - 2lm = 0$.

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5. If

$$f(x) = (a^2 - b^2)^{-1/2} \cdot \cos^{-1} \left(\frac{a \cos x + b}{a + b \cos x} \right) \quad a > b > 0 \text{ and } 0 < x < \pi$$

, then S.T $f'(x) = (a + b \cos x)^{-1}$.

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6. Find the angle between the curves $y^2 = 8x$ and $4x^2 + y^2 = 32$.



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7. Find the positive integers x and y such that $x + y = 60$ and xy^3 is maximum.



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