



# MATHS

## BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

### SOLVED MODEL PAPER-3

#### Section A

1. Find the length of the perpendicular drawn from the point given against the following

straight lines.

$$5x - 2y + 4 = 0, (-2, -3).$$



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2. Show that the points

$$A = (1, 2, 3), B = (7, 0, 1), C = (-2, 3, 4)$$

are colinear.



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3. Find the equation of the plane through the point  $(\alpha, \beta, \gamma)$  and parallel to the plane  $ax + by + cz = 0$



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



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5. Evaluate  $\lim_{x \rightarrow 0} \frac{e^{\sin x} - 1}{x}$



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6. If  $f(x) = 2x^2 + 3x + 5$ , then prove that  
 $f'(0) + 3f'(-1) = 0$



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7. If  $y^x = x^{\sin y}$  then find  $\frac{dy}{dx}$ .



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8. Find the lengths of subtangent and subnormal at a point on the curve

$$y = b \sin\left(\frac{x}{a}\right)$$



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## Section B

1. Find the equation of the locus of a point, which forms a triangle of area 2 with the points A(1, 1) and B (-2, 3).



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2. Find the equation of the straight line parallel to the line  $3x + 4y = 7$  and passing through the point of intersection of the lines  $x - 2y - 3 = 0$ ,  $x + 3y - 6 = 0$



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3. Is  $f$  defined by

$$f(x) = \begin{cases} \frac{\sin 2x}{x} & \text{if } x \neq 0 \\ 1 & \text{if } x = 0 \end{cases} \quad \text{continuous?}$$





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4. Find  $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$



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5. The radius of an air bubble is increasing at the rate of  $1/2$  cm/sec. At what rate is the volume of the bubble increasing when the radius is 1 cm?



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6. Find the equation of tangent and normal to the curve  $y = 2.e^{\frac{-x}{3}}$  at the point where the curve meets the Y - axis



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## Section C

1. Find the orthocentre of the triangle whose sides are given by  $x + y + 10 = 0$ ,  $x - y - 2 = 0$  and  $2x + y - 7 = 0$





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2. If  $(\alpha, \beta)$  is the centroid of the triangle,

whose sides are

$$ax^2 + 2hxy + by^2 = 0 \text{ and } lx + my = 1,$$

then show that

$$\frac{\alpha}{bl - hm} = \frac{\beta}{am - hl} = \frac{2}{3(bl^2 - 2hlm + am^2)}$$



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3. Find the condition for the lines joining the origin to the points of intersection of the circle  $x^2 + y^2 = a^2$  and the line  $lx+my=1$  to coincide.



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4.  $\Delta ABC$  is formed by a (1,8,4), B (0, -11,4) and C(2,-3,1) . If D is the foot of the perpendicular from A to BC . Then the coordinates of D are



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5. Find the derivative of  $\sin^{-1} \left( \frac{b + a \sin x}{a + b \sin x} \right)$

w.r. to  $x$ .



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6. Show that the square of the length of the subtangent at any point on the curve  $by^2 = (x + a)^3$  ( $b \neq 0$ ) varies with the length of the subnormal at that point



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7. Find the maximum area of the rectangle that can be formed with fixed perimeter 20.



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