



# MATHS

## BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

### SOLVED MODEL PAPER-1

#### Solved Model Paper 1 Maths 1 B

1. Find the value of  $x$ , if the slope of the line passing through  $(2,5)$  and  $(x,3)$  is 2.



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2. Transform the equation  $x + y + 1 = 0$  into Normal form.



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3. Show that the points  $(1,2,3)$ ,  $(2,3,1)$  and  $(3,1,2)$  form an equilateral triangle.



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4. Find the angle between the planes

$$2x - y + z = 6 \text{ and } x + y + 2z = 7$$



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5. Show that  $\lim_{x \rightarrow 0^+} \left( \frac{2|x|}{x} + x + 1 \right) = 3$ .



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6. Evaluate  $\lim_{x \rightarrow 0} \left( \frac{e^{3+x} - e^3}{x} \right)$



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7. If  $f(x) = a^x \cdot e^{x^2}$  then find  $f'(x)$



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8. Find the derivative of  $\log(\sin(\log x))$



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9. Find the approximate value of  $\sqrt[3]{65}$



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10. Verify Rolle's theorem for the function

$$y = f(x) = x^2 + 4 \text{ on } [-3,3]$$



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11. A(2,3) and B(-3,4) be two given points. Find the equation of the locus of P so that the area of the triangle PAB is 8.5 sq.units.



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12. When the axes are rotated through an angle  $\pi/6$ . Find the transformed equation of  $x^2 + 2\sqrt{3}xy - y^2 = 2a^2$ .



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13. Find the points on the line  $3x - 4y - 1 = 0$  which are at a distance of 5 units from the point (3,2).



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14.

Show

that

$$f(x) = \begin{cases} \frac{\cos ax - \cos bx}{x^2} & \text{if } x \neq 0 \\ \frac{1}{2}(b^2 - a^2) & \text{if } x = 0 \end{cases}$$

is continuous at 0



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15. Find the derivative of  $\sin 2x$  from the first principles .



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16. A particle is moving in a straight line so that after 't' seconds its distance is 'S' (in cms) from a

fixed point of the line is given be  $S=f(t)=8t + t^3$ .

Find (i) the velocity at time  $t=2$  (ii) the initial velocity (iii) acceleration at  $t=2$  sec



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17. S.T the tangent at any point  $\theta$  on the curve  $x = c \sec \theta, y = c \tan \theta$  is  $y \sin \theta = x - c \cos \theta$ .



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18. Find the equation of the straight lines passing through the point  $(1, 2)$  and making an angle of



$60^\circ$  with the line  $\sqrt{3}x + y + 2 = 0$



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**19.** Find the value of  $k$ , if the lines joining the origin with the points of intersection of the curve  $2x^2 - 2xy + 3y^2 + 2x - y - 1 = 0$  and the line  $x + 2y = k$  are mutually perpendicular.



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**20.** If a line makes angles  $\alpha, \beta, \lambda, \delta$  with the four diagonals of a cube, then show that

$$\cos^2 \alpha + \cos^2 \beta + \cos^2 \lambda + \cos^2 \delta = \frac{4}{3}.$$



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21. If  $x = \frac{3at}{1+t^3}$ ,  $y = \frac{3at^2}{1+t^3}$  then find  $\frac{dy}{dx}$ .



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22. At any point  $t$  on the curve  $x = a(t + \sin t)$ ,  $y = a(1 - \cos t)$  find the lengths of tangent and normal.



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**23.** A wire of length  $l$  is cut into two parts which are bent respectively in the form of a square and a circle. What are the lengths of pieces of wire so that the sum of areas is least ?



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