



MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MARCH-2017[AP]

Section A | Answer All The Following Vsaq

1. Find the slope of the $x + y = 0$ and $x - y = 0$.



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2. Transform the equation of $x + y + 1 = 0$

into

Normal form



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3. If $(3,2,-1)$, $(4,1,1)$ and $(6,2,5)$ are three vertices and $(4,2,2)$ is the centroid of a tetrahedro, find the fourth vertex to that tetrahedron.



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4. Find the angle between the planes $2x - y + z = 6$ and $x + y + 2z = 7$.



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5. Evaluate $\lim_{x \rightarrow 0} \frac{e^{7x} - 1}{x}$



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6. Compute $\lim_{x \rightarrow \infty} \frac{x^2 + 5x + 2}{2x^2 - 5x + 1}$



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7. Find the derivative of $5 \sin x + e^x \log x$.



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8. If $y = \sec^{-1} \left(\frac{1}{2x^2 - 1} \right)$ find $\frac{dy}{dx}$.



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9. Find Δy and dy for the function $y = x^2 + x$, when $x = 10$, $\Delta x = 0.1$



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10. Verify Rolle's theorem for the function $y = f(x) = x^2 + 4$ on $[-3,3]$



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**Section B ii Answer Any Five Of The Following
Saqs**

1. $A(1, 2)$, $B(2, -3)$, $C(-2, 3)$ are 3 points.

A point P moves such that

$$PA^2 + PB^2 = 2PC^2 .$$

Show that the equation to the locus of P is $7x - 7y + 4 = 0$.



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2. When the axes rotated through an angle

$\frac{\pi}{4}$, find the transformed equation of

$$3x^2 + 10xy + 3y^2 = 9.$$



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3. Find the value of p , if the lines $3x + 4y = 5$,
 $2x + 3y = 4$, $px + 4y = 6$ are concurrent.



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4. Check the continuity of the following
function at $x = 2$.

$$f(x) = \begin{cases} \frac{1}{2}(x^2 - 4) & \text{if } 0 < x < 2 \\ 0 & \text{if } x = 2 \\ 2 - 8x^{-3} & \text{if } x > 2 \end{cases}$$



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



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6. 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 by $S=f(t)=8t + t^3$.

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





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



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Section C Iii Answer Any Five Of The Following Laqs

1. Find the circumcenter of the triangle whose vertices are $(-2, 3)$, $(2, -1)$, $(4, 0)$.



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2. Prove that the area of the triangle formed by

$y = x + c$ and the pair of lines

$$ax^2 + 2hxy = by^2 = 0 \text{ is } \frac{e^2 \sqrt{h^2 - ab}}{|a + b + 2h|} \text{ sq.}$$

units.



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3. 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 $x + 2y = k$ are mutually perpendicular .



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4. Find the angle between the lines whose d.c's are _____ related _____ by

$$l + m + n = 0 \& l^2 + m^2 - n^2 = 0$$



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5. Find $\frac{dy}{dx}$, if $y = (\sin x)^{\log x} + x^{\sin x}$



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6. Find the angle between the curves $xy=2$ and

$$x^2 + 4y = 0$$



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7. 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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