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MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MAY-2015(AP)

Section A

1. Find the perpendicular distance from the point (3,4) to the straight line:

$3x - 4y + 10 = 0.$

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2. Find the equation of the straight line passing through the points $(at_1^2, 2at_1), (at_2^2, 2at_2).$

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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

$x + 2y + 2z - 5 = 0$ and

$3x + 3y + 2z - 8 = 0$

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5. Evaluate $Lt_{x \to \infty} \frac{3x^2 + 4x + 5}{2x^2 + 3x - 7}$

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6. Is the function f , defined by $f(x) = \begin{cases} x^2 & \text{if } x \leq 1 \\ x & \text{if } x > 1 \end{cases}$ continuous on R ?

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7. Find the derivative of the function

$$\left(x^2 - 3\right)\left(4x^3 + 1\right)$$

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8. If $y = \frac{2x+3}{4x+5}$ then find y''.

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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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Section B

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 7 x - 7y + 4 = 0 .

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2. When the origin is shifted to the point (2 , 3) the transformed equation of a curve is $x^2 + 3xy - 2y^2 + 17x - 7y - 11 = 0$. Find the original equation of curve.

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3. Find the equation of the straight ine through A(1,3) and (i) parallel (ii) perpendicular to the straight line passing through B(3,-5) and C(-6,1).

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4. $\underset{x \to 0}{\text{Lt}} \dfrac{\sqrt[3]{1+x} - \sqrt[3]{1-x}}{x} =$

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5. Find the derivative of $\tan 2x$ from the first principle.

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6. S.T the curves $y^2 = 4(x+1), y^2 = 36(9-x)$ intersect orthogonally.

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7. The total cost C(x) in Rupees, associated with the production of x units of an item is given by

$C(x) = 0.005x^3 - 0.02x^2 + 30x + 5000$

Find the marginal cost when 3 units are produced, where by marginal cost we mean the instantaneous rate of change of total cost at any level of output.

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Section C

1. Find the orthocentre of the triagle whose vertices are $(-2, -1)(6, -1), (2, 5).$

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2. Show that the product of the perpendicular from (alpha,beta) to the pair of lines $S \equiv ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ is $\frac{\left|a\alpha^2 + 2h\alpha\beta + 2g\alpha + 2f\beta + c\right|}{\sqrt{(a-b)^2 + 4h^2}}$ Hence or otherwise find the product of the perpendicular from the origin

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3. Write down the equation of the pair of straight lines joining the origin to the points of intersection of the $6x - y + 8 = 0$ with the pair of straight lines $3x^2 + 4xy - 4y^2 - 11x + 2y + 6 = 0$. Show that the lines so obtained make equal angles with the coordinates axes.

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4. Find the angle between the lines, whose direction cosines are given by the equation $3l + m + 5n = 0$ and $6mn - 2nl + 5lm = 0$.

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5. If $\frac{\sqrt{1+x^2} + \sqrt{1-x^2}}{\sqrt{1+x^2} - \sqrt{1-x^2}} = 3$ then x=

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6. Show that the tangent at $P(x_1, y_1)$ on the curve

$\sqrt{x}+\sqrt{y}=\sqrt{a}$ is $xx_1^{\frac{-1}{2}}+yy_1^{\frac{-1}{2}}=a^{\frac{1}{2}}$

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