MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MAY-2014

Section A

1. Transformation the equation $4x - 3y + 12 = 0$ into

(i) slope intercept form (ii) intercept form

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2. Find the value of 'p' if the lines $4x - 3y - 7 = 0, 2x + py + 2 = 0$ and $6x + 5y - 1 = 0$ are concurrent .,

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3. Find the ratio which the XZ -plane divides the line joining $A(-2, 3, 4)$ and $B(1, 2, 3)$

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4. Find the equation of the plane which makes intercepts 1,2,4 on the x,y,z - axes respectively.

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5. Evaluate $Lt_{x \to 0} \frac{x(e^x - 1)}{1 - \cos x}$

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

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7. If $f(x) = 1 + x + x^2 + \ldots\ldots\ldots\ldots + x^{100}$, then find $f'(1)$.

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8. If $y = ae^{nx} + be^{-nx}$, then prove that $y'' = n^2 y$.

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9. If the increase in the side of a square is 4% then find the approximate percentage of increase in the area of the square.

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10. Define the strictly increasing function and strictly decreasing function on an interval.

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Section B

1. If the distance from 'P' to the points (2,3) and (2,-3) are in the ratio 2:3, then find the equation of the locus of P.

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2. When the axes rotated through an angegle $\frac{\pi}{4}$, find the transformed equation of $3x^2 + 10xy + 3y^2 = 9$.

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3. If $Q(h, k)$ is the foot of the perpendicular of $P(x_1, y_1)$ on the line $ax + by + c = 0$ then prove that $(h - x_1), a = (k - y_1), b = -(ax_1 + by_1 + c) : (a^2 + b^2)$.

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4. 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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5. Find the derivative of $\cos ax$ from the first Principle.

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6. Find the equations of the tangent and the normal to the curve $y = x^3 + 4x^2$ at (-1,3)

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7. Find the length of subtangent, subnormal at a point on the curve

x=a(cost+sint), y=a(sint-tcost)

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Section C

1. Find the orthocentre of the triangle formed by the lines $x + 2y = 0, 4x + 3y = 5$ and $3x + y = 0$

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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. Find the angle between the lines joining the origin to the points of intersection of the curve $x^2 + 2xy + y^2 + 2x + 2y - 5 = 0$ and the line 3x-y+1=0.

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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. If $\sqrt{1-x^2}+\sqrt{1-y^2}=a(x-y)$ then prove that $\frac{dy}{dx}=\frac{\sqrt{1-y^2}}{\sqrt{1-x^2}}$.

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6. The curves $ax^2+by^2=1$ and $Ax^2+By^2=1$ intersect orthogonally, then

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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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