MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MARCH 2013

Section A

1. Find the equation of straight line passing through the point (5,4) and parallel to the line $2x + 3y + 7 = 0$.

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2. Find the value of p, if straight line $x + p = 0, y + 2 = 03x + 2y + 5 = 0$ are concurrent.

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3. Show that the points $A = (1, 2, 3), B = (7, 0, 1), C = (-2, 3, 4)$ are colinear.

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4. Find the direction cosines of the normal to the plane $x + 2y + 2z - 4 = 0$

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5. Compute $\text{Lt}_{x \to 0} \frac{a^x - 1}{b^x - 1}, (a > 0, b > 0, b \neq 1)$

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6. Evaluate $Lt_{x \to 0} \frac{e^x - \sin x - 1}{x}$

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7. If $y = \sin^{-1} \sqrt{x}$, then find $\frac{dy}{dx}$.

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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 the approximate value of $\sqrt{82}$

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10. Let $f(x) = (x-1)(x-2)(x-3)$ then prove that there is more than one 'c' in (1,3) such that $f'(c) = 0$

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Section B

1. Find the equation of locus of P, if the line segment joining (2,3) & (-1,5) subtends a right angle at P.

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2. Prove that the angle of rotation of the axes to eliminate xy term from the equation $ax^2 + 2hxy + by^2 = 0$ is $\tan^{-1}\left(\frac{2h}{a-b}\right)$ where $a \neq b$ and $\frac{\pi}{4}$ if $a = b$.

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3. Find the point on the straight line $3x + y + 4 = 0$ which is equidistant from the points (-5,6) and (3,2).

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4. Is f given by $f(x) = \begin{cases} \frac{x^2-9}{x^2-2x-3} & \text{if } 0 < x < 5 \text{ and } x \neq 3 \\ 1.5 & \text{if } x = 3 \end{cases}$, continuous at the point 3.

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

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6. The volume of a cube is increasing at a rate of 9 cubie centimeters per second. How fast is the surface area increasing when the length of edge is 10 cms?

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7. Find lengths of normal and subnormal at a point on the curve $y = \frac{a}{2}\left(e^{\frac{x}{a}} + e^{-\frac{x}{a}}\right)$

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Laqs

1. 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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2. 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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3. 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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4. Find the derivative of $(\sin x)^{\log x}+x^{\sin x}$.

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5. IF the tangent at a point on the curve $x^{2/3}+y^{2/3}=a^{2/3}$ intersects the coordinate axes in A and B then show that the length AB is a constant.

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6. Show that when the curved surface of a is right circular cylinder inscribed in a sphere of radius R is maximum , then the height of the cylinder is $\sqrt{2R}$.

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