MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MAY-2017(AP)

Section 1

1. Find the equationof the straight line passing through the point (-2,4) and making

intercepts, whose sum is zero

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2. Find the value of k if the straight lines $6x - 10y + 3 = 0$ and $kx - 5y + 8 = 0$ are parallel.

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3. Show that the points (5,4,2),(6,2,-1) and(8,-2,-7)` are collinear.

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

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5. Evaluate $Lt_{x \to 0} \frac{\sqrt{1+x} - 1}{x}$

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6. Is f defined by

$$f(x) = \begin{cases} \frac{\sin 2x}{x} & \text{if } x \neq 0 \\ 1 & \text{if } x = 0 \end{cases}$$ continuous0 ?

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7. Find the derivative of $\log(\sec x + \tan x)$.

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8. If $y = e^t + \cos t, x = \log t + \sin t$ then find $\frac{dy}{dx}$.

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9. Find dy and $\triangle y$ of $y = x^2 + x$ at x=10 when $\triangle x = 0.1$.

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10. State Rolle's Theorem.

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Section 2

1. A(5,3) and B(3,-2) are 2 fixed points. Find the equation of locus of P, so that the area of $\triangle PAB$ is 9sq. Units.

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

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4. Show that

$$Lt_{x \to 0} \frac{\cos ax - \cos bx}{x^2} = \frac{b^2 - a^2}{2}$$

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

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6. A stone is dropped into a quiet lake and ripples move in circles at the speed of 5 cm/sec. At the instant when the radius of circular ripple is 8cm, how fast is the enclosed area increases?

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7. Show that at any point (x,y) on the curve $y = b^{\frac{x}{a}}$, the length of the subtangent is a constant and the length of the subnormal is $\frac{y^2}{a}$.

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Section 3

1. Find the circumcentre of the triangle whose vertices are (1,3) (-3,5) and (5,-1).

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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 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. A window is in the shape of a rectangle surmounted by a semi-circle. If the perimeter of the window be 20 feet then find the maximum area.

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