



MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE:MAY-2016 (AP)

Section 1

1. Find the equation of the straight line perpendicular to the line $5x - 3y + 1 = 0$

and passing through the point $(4, -3)$.



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2. Find the equation of the straight line passing through $(-4, 5)$ and cutting off equal intercepts on the coordinate axes.



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3. Show that the points $(1,2,3)$, $(2,3,1)$ and $(3,1,2)$ form an equilateral triangle.



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4. Write the equations of the plane $4x - 4y + 2z + 5 = 0$ in the intercept form.



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



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6. Evaluate $\lim_{x \rightarrow 2} \left(\frac{1}{x-2} - \frac{4}{x^2-4} \right)$



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7. Find the derivative of 7^{x^3+3x} .



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8. If $y = ax^{n+1} + bx^{-n}$ then show that $x^2 y'' = n(n+1)y$.



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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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Section 2

1. Find the locus of P If the distance of P from $(3,0)$ is twice the distance of P from $(-3,0)$



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2. When the axes are rotated through an angle 45° , the transformed equation of a curve is $17x^2 - 16xy + 17y^2 = 225$. Find the original equation of the curve.



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3. Find the value of k if the angle between the straight lines

$$4x - y + 7 = 0, kx - 5y - 9 = 0 \text{ is } 45^\circ$$



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4. If f is given by

$$f(x) = \begin{cases} k^2x - k & \text{if } x \geq 1 \\ 2 & \text{if } x < 1 \end{cases}$$
 is a continuous

function on \mathbb{R} , then find k .



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5. Find the derivative of $\sin 2x$ from the first principles.



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6. The radius of a circle is increasing at the rate of 0.7 cm/s. What is the rate of increase of its circumference?



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7. Find the value of k , so that the length of the subnormal at any point on the curve $y = a^{1-k}x^k$ is a constant



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Section 3

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



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2. Prove that the equation

$$3x^2 + 7xy + 2y^2 + 5x + 5y + 2 = 0$$

represents a pair of straight lines. Find the point of intersection. Also find the angle between them.



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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 direction cosines of the two lines which are connected by the relations

$$l - 5m + 3n = 0, 7l^2 + 5m^2 - 3n^2 = 0$$



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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. 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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7. Find the maximum area of the rectangle that can be formed with fixed perimeter 20.



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