MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE: MAY-2017[TS]

Answer All The Following Vsaq

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

Normal form

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2. Find the value of p, if straight line

$x + p = 0, y + 2 = 03x + 2y + 5 = 0$ are

concurrent.

3. Find the ratio in which the XZ-plane divides line

joining A(-2,3,4) and B(1,2,3)

4. Find the equation of the plane If the foot of the perpendicular from origin of the plane is A(2,3,-5).

5. Evaluate $Lt_{x \to 0}([x] + x)$

6. Evaluate $Lt_{x \to 1} \dfrac{\log_e x}{x - 1}$

7. If

$$y = \tan^{-1}\left(\sin\sqrt{x}\right) + \csc^{-1}\left(e^{2x+1}\right), \quad \text{then} \quad \frac{dy}{dx} =$$

8. Show that $y = x + \tan x$ satisfies the equation

$$\cos^2 x \, \frac{dy^2}{dx^2} + 2x = 2y.$$

9. Find the approximate value of $\sqrt[4]{17}$

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

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3. Find the value of k if the angle between the straight lines $4x - y + 7 = 0, kx - 5y - 9 - 0$ is $45°$

4. Show that
$$f(x) = \begin{cases} \frac{\cos ax - \cos bx}{x^2} & \text{if } x \neq 0 \\ \frac{1}{2}(b^2 - a^2) & \text{if } x = 0 \end{cases}$$
where a and b are real constants is continuous at x = 0.

5. $\int \dfrac{\log x}{(1 + \log x)^2} dx =$

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6. At any point t on the curve x=a(t+sint), y=a(1-cost), find the lengths of tangent, normal, subtangent and subnormal.

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7. A container is in the shape of an inverted cone has height 8m and radius 6m at the top. If it is filled with

water at the rate of $2m^3$/minute, how fast is the height of water changing when the level is 4m?

Answer Any Five Of The Following Laqs

1. Find the orthocentre of the triangle whose vertices are $(-5, -7), (13, 2), (-5, 6)$

2. If (α, β) is the centroid of the triangle, whose sides are $ax^2 + 2hxy + by^2 = 0$ and $lx + my = 1$, then show that

$$\frac{\alpha}{bl - hm} = \frac{\beta}{am - hl} = \frac{2}{3(bl^2 - 2hlm + am^2)}$$

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3. Find the value if k , if the lines joining the origin with the points of intersection of the curve $2x^2 - 2xy + 3y^2 + 2x - y - 1 = 0$ and the x + 2y = k are mutually perpendicular .

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4. Find the direction cosines of the two lines which are connected by the relations l + m + n = 0 an mn - 2nl - 2lm = 0.

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5. If $\cos^{-1}\left[\dfrac{\cos\alpha + \cos\beta}{1 + \cos\alpha\cos\beta}\right] = 2\tan^{-1}x$ then x=

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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.

7. Prove that the radius of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone is half of that of the cone.