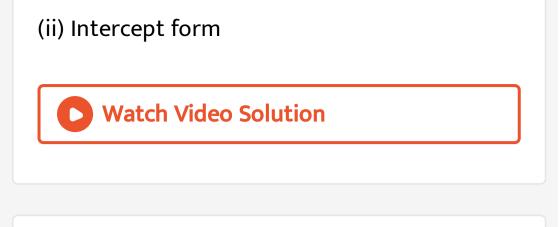# MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

IPE-MARCH-2016[TS]

Section A I Answer All The Following Vsaq

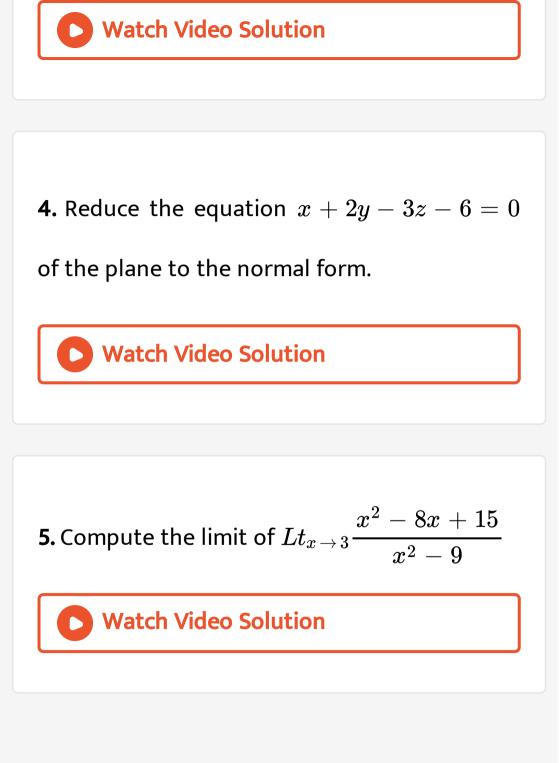**1.** Transform the equation $\sqrt{3x} + y = 4$ into
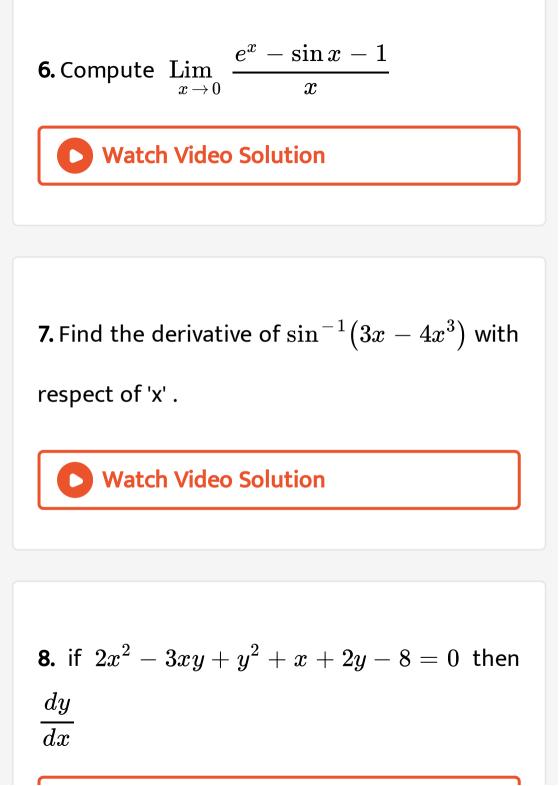
(i) Slope intercept form

(ii) Intercept form

2. Find the value of p if the straight lines 3x + 7 y - 1 = 0 and 7 x - py + 3 = 0 are mutually perpendicular .

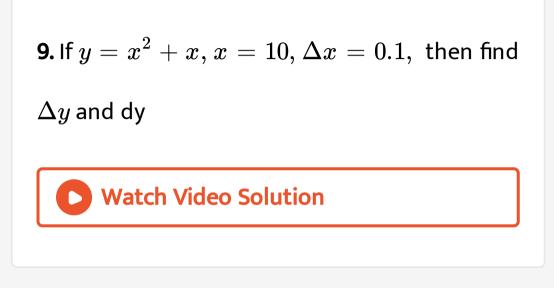**3.** Show that the point (1 , 2 , 3), (7 , 0 1), (- 2, 3, 4) are collinear.

4. Reduce the equation $x + 2y - 3z - 6 = 0$ of the plane to the normal form.

5. Compute the limit of $Lt_{x \to 3} \dfrac{x^2 - 8x + 15}{x^2 - 9}$

6. Compute $\displaystyle\lim_{x \to 0} \frac{e^x - \sin x - 1}{x}$

7. Find the derivative of $\sin^{-1}(3x - 4x^3)$ with respect of 'x' .

8. if $2x^2 - 3xy + y^2 + x + 2y - 8 = 0$ then $\dfrac{dy}{dx}$

9. If $y = x^2 + x$, $x = 10$, $\Delta x = 0.1$, then find

Δy and dy

10. Find the lengths of subtangent and subnormal at a point on the curve $y = b\sin\left(\dfrac{x}{a}\right)$

1. Find the equation of locus of a point, the sum of whose distances from (0 , 2) and (0 , -2) is 6 .

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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.

3. Find the equation of the straight line parallel to the line 3x + 4y = 7 and passing through the point of intersection of the lines x - 2y - 3 = 0 , x + 3y - 6 = 0

4. Check the continuity of 'f' given by

$$f(x) = \begin{cases} 4 - x^2 & \text{if } x \leq 0 \\ x - 5 & \text{if } 0 < x \leq 1 \\ 4x^2 - 9 & \text{if } 1 < x < 2 \\ 3x + 4 & \text{if } x \geq 2 \end{cases} \text{at point s}$$

x = 0, 1, 2.

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5. x = a (cost + t sint) , y = a (sint - tcost) find $\frac{dy}{dx}$.

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6. Find the equation of tangent and normal to the curve $y = 2 \cdot e^{\frac{-x}{3}}$ at the point where the curve meets the Y - axis

7. A point P is moving on the curve $y = 2x^2$. The x coordinate of P is increasing at the rate of 4 units per second . Find the rate at which y coordinate is incerasing when the point is at (2,8).
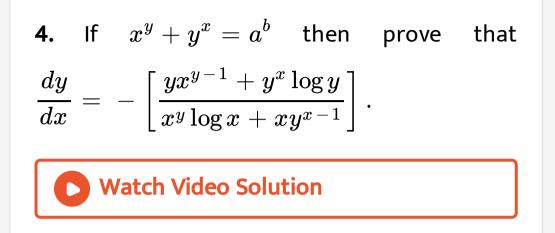
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Section C Iii Answer Any Five Of The Following Laqs

1. The base of an equilateral triangle x + y = 2 = 0 and opposite vertex is (2 , - 1). Find the equations of the remaining sides .

2. Show that the lines joining the origin with the points of intersection of the curve $7x^2 - 4xy + 8y^2 + 2x - 4y - 8 = 0$ with the line $3x - y = 2$ are mutually perpendicular.

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3. 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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4. If $x^y + y^x = a^b$ then prove that $\dfrac{dy}{dx} = -\left[\dfrac{yx^{y-1} + y^x \log y}{x^y \log x + xy^{x-1}}\right]$.

5. 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 $\sqrt{2R}$.

6. If $ax^2 + by^2 = 1, a_1x^2 + b_1y^2 = 1$, then show that the condition for orthogonality of above curves is $\dfrac{1}{a} - \dfrac{1}{b} = \dfrac{1}{a_1} - \dfrac{1}{b_1}$