

Student Name: _____

Score: _____

Derivatives of Implicit Functions

Find the derivatives of implicit functions:

$$x^2 + y^2 = 25$$

$$x^3 + y^3 = 4$$

$$y^3 - x^2 = -10$$

$$(x - y)^2 = x + y - 1$$

$$x^2 y^3 + x^3 y^2 = 1$$

$$x = 3 + \sqrt{x^2 + y^2}$$

$$y^4 = 4x^3 + 5x - 3y + 1$$

$$e^{xy} = e^{4x} - e^{5y}$$

$$x = \cos(xy)$$

$$\sin(2x + 5y) = y$$

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Answers:

$$\frac{dy}{dx} = \frac{-x}{y}$$

$$\frac{dy}{dx} = \frac{-x^2}{y^2}$$

$$\frac{dy}{dx} = \frac{2x}{3y^2}$$

$$\frac{dy}{dx} = \frac{2y - 2x + 1}{2y - 2x - 1}$$

$$\frac{dy}{dx} = -\frac{2xy^3 + 3x^2y^2}{3x^2y^2 + 2x^3y}$$

$$\frac{dy}{dx} = \frac{\sqrt{x^2 + y^2} - x}{y}$$

$$\frac{dy}{dx} = \frac{12x^2 + 5}{4y^3 + 3}$$

$$\frac{dy}{dx} = \frac{4e^{4x} - ye^{xy}}{xe^{xy} + 5e^{5y}}$$

$$\frac{dy}{dx} = -\left(\frac{1}{x}\right)(y + \csc xy)$$

$$\frac{dy}{dx} = \frac{2}{\sec(2x+5)-5}$$