

MCS 121 Implicit Differentiation

Assume that y is a function of x . Find $y' = \frac{dy}{dx}$ in each case.

1. $x^5 + y^5 = 32$.

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

3. $e^{xy} = x$

4. $\frac{y}{x} + \sqrt{y} = 1$

5. $\ln(xy) + \ln y^5 = 4$

6. $\sin(x + y) + xy = 5$

ANSWERS

$$1. y' = -\frac{x^4}{y^4}.$$

$$2. y' = \frac{2xy^3 + 1}{1 - 3x^2y^2}.$$

$$3. y' = \frac{1 - ye^{xy}}{xe^{xy}}.$$

$$4. y' = \frac{2y^{3/2}}{2xy^{1/2} - x^2}.$$

$$5. y' = -\frac{y}{6x}.$$

$$6. y' = -\frac{\cos(x + y) + y}{\cos(x + y) + x}.$$