

Implicit Differentiation Second Derivative

For each problem, use implicit differentiation to find $\frac{d^2y}{dx^2}$ in terms of x and y .

1) $-5y^2 + 2 = 5x$

2) $5x^3 + y^2 = 1$

3) $x = -5y^2 + 3$

4) $3x = -2y^2 + 2$

5) $y^2 + 3 = 2x^2$

6) $3x^3 - y^2 = 4$

7) $2x - 5y^2 = 1$

8) $2 = 3x^2 + 4y^2$

9) $-3y^2 + 1 = 3x^3$

10) $4x - y^2 = 3$

Answers to Implicit Differentiation Second Derivative

$$1) \frac{d^2y}{dx^2} = -\frac{1}{4y^3}$$

$$4) \frac{d^2y}{dx^2} = -\frac{9}{16y^3}$$

$$7) \frac{d^2y}{dx^2} = -\frac{1}{25y^3}$$

$$10) \frac{d^2y}{dx^2} = -\frac{4}{y^3}$$

$$2) \frac{d^2y}{dx^2} = \frac{-60xy^2 - 225x^4}{4y^3}$$

$$5) \frac{d^2y}{dx^2} = \frac{2y^2 - 4x^2}{y^3}$$

$$8) \frac{d^2y}{dx^2} = \frac{-12y^2 - 9x^2}{16y^3}$$

$$3) \frac{d^2y}{dx^2} = -\frac{1}{100y^3}$$

$$6) \frac{d^2y}{dx^2} = \frac{36xy^2 - 81x^4}{4y^3}$$

$$9) \frac{d^2y}{dx^2} = \frac{-12xy^2 - 9x^4}{4y^3}$$