

## Implicit Differentiation - Extra Practice

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

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

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

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

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

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

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

7)  $-3x^2y^2 - 2y^3 + 5 = 5x^2$

8)  $4x^2 + 4xy = -5x^3y + 4$

9)  $-5xy - 3xy^2 + 5 = 5x^2$

10)  $-4x^2y^3 + 2 = 5x^2 + y^2$

11)  $4x = -5y^2 - x^2y + 4$

12)  $-x^3y^2 + 4 = 5x^2 + 3y^3$

## Answers to Implicit Differentiation - Extra Practice

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

$$2) \frac{dy}{dx} = \frac{2}{9y^2}$$

$$3) \frac{dy}{dx} = \frac{2x^2}{-2y^2 - 1}$$

$$4) \frac{dy}{dx} = \frac{15x^2 + 2xy^2}{-2yx^2 - 9y^2}$$

$$5) \frac{dy}{dx} = \frac{-3x^2 - 6xy - 5y}{3x^2 + 5x}$$

$$6) \frac{dy}{dx} = \frac{12x^2 + 2y^2 + 6y^3x}{-4xy - 9x^2y^2}$$

$$7) \frac{dy}{dx} = \frac{5x + 3xy^2}{-3yx^2 - 3y^2}$$

$$8) \frac{dy}{dx} = \frac{-15x^2y - 8x - 4y}{4x + 5x^3}$$

$$9) \frac{dy}{dx} = \frac{10x + 5y + 3y^2}{-5x - 6xy}$$

$$10) \frac{dy}{dx} = \frac{5x + 4xy^3}{-6y^2x^2 - y}$$

$$11) \frac{dy}{dx} = \frac{2xy + 4}{-10y - x^2}$$

$$12) \frac{dy}{dx} = \frac{10x + 3x^2y^2}{-2yx^3 - 9y^2}$$