

Calculus Practice: Implicit Differentiation 1b

For each problem, use implicit differentiation to find $\frac{dy}{dx}$ at the given point.

1) $2x^2 + 4y^3 = -5x + 2$ at $(-2, 1)$

2) $-3x^2y - 4x + 4 = 2x^2$ at $(2, -1)$

3) $-x^3 + 2 = 2x + 5x^2y$ at $(-1, 1)$

4) $4 = 4x^3 - y^3$ at $(-1, -2)$

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

6) $-3xy + 3 = 5x + xy^2$ at $(1, -2)$

7) $-5xy^2 + 1 = 4x^2 + 5y^3$ at $(-2, -1)$

8) $-3xy + x^3y = 2x$ at $(2, 2)$

9) $2y^3 = x + 3xy^3$ at $(1, -1)$

10) $x^3 = -2x^3y^3 - 2xy + 3$ at $(-1, -1)$

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For each problem, use implicit differentiation to find $\frac{dy}{dx}$ at the given point.

1) $2x^2 + 4y^3 = -5x + 2$ at $(-2, 1)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=-2 \\ y=1}} = \frac{1}{4}$$

2) $-3x^2y - 4x + 4 = 2x^2$ at $(2, -1)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=2 \\ y=-1}} = 0$$

3) $-x^3 + 2 = 2x + 5x^2y$ at $(-1, 1)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=-1 \\ y=1}} = 1$$

4) $4 = 4x^3 - y^3$ at $(-1, -2)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=-1 \\ y=-2}} = 1$$

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

$$\left. \frac{dy}{dx} \right|_{\substack{x=-2 \\ y=-2}} = \frac{1}{2}$$

6) $-3xy + 3 = 5x + xy^2$ at $(1, -2)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=1 \\ y=-2}} = 3$$

7) $-5xy^2 + 1 = 4x^2 + 5y^3$ at $(-2, -1)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=-2 \\ y=-1}} = \frac{11}{35}$$

8) $-3xy + x^3y = 2x$ at $(2, 2)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=2 \\ y=2}} = -8$$

9) $2y^3 = x + 3xy^3$ at $(1, -1)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=1 \\ y=-1}} = \frac{2}{3}$$

10) $x^3 = -2x^3y^3 - 2xy + 3$ at $(-1, -1)$

$$\left. \frac{dy}{dx} \right|_{\substack{x=-1 \\ y=-1}} = -\frac{5}{8}$$