Calculus Practice: Implicit Differentiation 1a

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

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

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

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

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

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

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

A) $\left.\frac{dy}{dx}\right|_{\substack{x=2\\y=5}} = 4$

B) $\left.\frac{dy}{dx}\right|_{\substack{x=2\\y=5}} = 1$

C) $\left.\frac{dy}{dx}\right|_{\substack{x=2\\y=5}} = -4$

D) $\left.\frac{dy}{dx}\right|_{\substack{x=2\\y=5}} = \frac{1}{4}$

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

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

B) $\left.\frac{dy}{dx}\right|_{\substack{x=2\\y=-2}} = -\frac{24}{25}$

C) $\left.\frac{dy}{dx}\right|_{\substack{x=2\\y=-2}} = -\frac{25}{24}$

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

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

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

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

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

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

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

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

B) $\left.\frac{dy}{dx}\right|_{\substack{x=-1\\y=1}} = -\frac{9}{5}$

C) $\left.\frac{dy}{dx}\right|_{\substack{x=-1\\y=1}} = \frac{4}{9}$

D) $\left.\frac{dy}{dx}\right|_{\substack{x=-1\\y=1}} = \frac{9}{4}$

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

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

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

C) $\left.\frac{dy}{dx}\right|_{\substack{x=-2\\y=1}} = -7$

D) $\left.\frac{dy}{dx}\right|_{\substack{x=-2\\y=1}} = -\frac{1}{7}$

7) $2x^2y^2 = 2x^3 + 3x^3y$ at $(-2, -2)$

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

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

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

8) $5x^3 = -4x^2y - 5y^2 + 4$ at $(-1, 1)$

A) $\left.\frac{dy}{dx}\right|_{\substack{x=-1\\y=1}} = \frac{7}{5}$

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

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

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

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

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

B) $\left.\frac{dy}{dx}\right|_{\substack{x=1\\y=1}} = -\frac{4}{3}$

C) $\left.\frac{dy}{dx}\right|_{\substack{x=1\\y=1}} = -\frac{3}{4}$

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

10) $-4y^3 + 5 = x + 3y$ at $(-2, 1)$

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

B) $\left.\frac{dy}{dx}\right|_{\substack{x=-2\\y=1}} = -15$

C) $\left.\frac{dy}{dx}\right|_{\substack{x=-2\\y=1}} = -\frac{1}{15}$

D) $\left.\frac{dy}{dx}\right|_{\substack{x=-2\\y=1}} = -\frac{6}{5}$

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