

Calculus Practice: Calculating Derivatives 1a

Differentiate each function with respect to x .

1) $y = 2$

A) $\frac{dy}{dx} = -2$

B) $\frac{dy}{dx} = -7$

C) $\frac{dy}{dx} = 0$

D) $\frac{dy}{dx} = 4$

2) $f(x) = 5x^5 + 5x - 4$

A) $f'(x) = 25x + 5x + 1$
 $= 30x + 1$

B) $f'(x) = 25x^4 + 5$

C) $f'(x) = 25x^5 + 5x - 5$

D) $f'(x) = 5x^4 + 5 - 7$
 $= 5x^4 - 2$

3) $f(x) = x^5 + 3x^3$

A) $f'(x) = 5x^4 + 9x^2$

B) $f'(x) = x^4 + 3x^2$

C) $f'(x) = 5x^5 + 9x^3$

D) $f'(x) = 5x + 9x$
 $= 14x$

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

A) $\frac{dy}{dx} = \frac{2}{3}x^2$
 $= \frac{2x^2}{3}$

B) $\frac{dy}{dx} = \frac{2}{3}x$
 $= \frac{2x}{3}$

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

D) $\frac{dy}{dx} = \frac{1}{3}x$
 $= \frac{x}{3}$

5) $f(x) = \frac{3}{4}x^3 - \frac{3}{5}$

A) $f'(x) = \frac{9}{4}x + 7$
 $= \frac{9x}{4} + 7$

B) $f'(x) = \frac{9}{4}x^3 - 1$
 $= \frac{9x^3}{4} - 1$

C) $f'(x) = \frac{3}{4}x^2 - 5$
 $= \frac{3x^2}{4} - 5$

D) $f'(x) = \frac{9}{4}x^2$
 $= \frac{9x^2}{4}$

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

A) $\frac{dy}{dx} = -\frac{3}{5}x^4 + 7$
 $= -\frac{3x^4}{5} + 7$

B) $\frac{dy}{dx} = -3x^5 - 3$

C) $\frac{dy}{dx} = -3x^4$

D) $\frac{dy}{dx} = -3x + 5$

$$7) f(x) = x^{-1} + x^{-5}$$

$$\begin{aligned} \text{A) } f'(x) &= -x^{-2} - 5x^{-6} \\ &= -\frac{1}{x^2} - \frac{5}{x^6} \end{aligned}$$

$$\begin{aligned} \text{B) } f'(x) &= -x^{-1} - 5x^{-5} \\ &= -\frac{1}{x} - \frac{5}{x^5} \end{aligned}$$

$$\begin{aligned} \text{C) } f'(x) &= x^{-2} + x^{-6} \\ &= \frac{1}{x^2} + \frac{1}{x^6} \end{aligned}$$

$$\begin{aligned} \text{D) } f'(x) &= -x - 5x \\ &= -6x \end{aligned}$$

$$9) f(x) = 2x^{-1} - 5x^{-3} + 3x^{-5}$$

$$\begin{aligned} \text{A) } f'(x) &= -2x^{-2} + 15x^{-4} - 15x^{-6} \\ &= -\frac{2}{x^2} + \frac{15}{x^4} - \frac{15}{x^6} \end{aligned}$$

$$\begin{aligned} \text{B) } f'(x) &= -2x + 15x - 15x \\ &= -2x \end{aligned}$$

$$\begin{aligned} \text{C) } f'(x) &= 2x^{-2} - 5x^{-4} + 3x^{-6} \\ &= \frac{2}{x^2} - \frac{5}{x^4} + \frac{3}{x^6} \end{aligned}$$

$$\begin{aligned} \text{D) } f'(x) &= -2x^{-1} + 15x^{-3} - 15x^{-5} \\ &= -\frac{2}{x} + \frac{15}{x^3} - \frac{15}{x^5} \end{aligned}$$

$$11) y = -\frac{2}{5}x^{-2}$$

$$\begin{aligned} \text{A) } \frac{dy}{dx} &= \frac{4}{5}x^{-2} \\ &= \frac{4}{5x^2} \end{aligned}$$

$$\begin{aligned} \text{B) } \frac{dy}{dx} &= \frac{4}{5}x \\ &= \frac{4x}{5} \end{aligned}$$

$$\begin{aligned} \text{C) } \frac{dy}{dx} &= \frac{4}{5}x^{-3} \\ &= \frac{4}{5x^3} \end{aligned}$$

$$\begin{aligned} \text{D) } \frac{dy}{dx} &= -\frac{2}{5}x^{-3} \\ &= -\frac{2}{5x^3} \end{aligned}$$

$$8) f(x) = 3x^{-1} + 2x^{-3} + 5x^{-4}$$

$$\begin{aligned} \text{A) } f'(x) &= -3x - 6x - 20x \\ &= -29x \end{aligned}$$

$$\begin{aligned} \text{B) } f'(x) &= -3x^{-2} - 6x^{-4} - 20x^{-5} \\ &= -\frac{3}{x^2} - \frac{6}{x^4} - \frac{20}{x^5} \end{aligned}$$

$$\begin{aligned} \text{C) } f'(x) &= 3x^{-2} + 2x^{-4} + 5x^{-5} \\ &= \frac{3}{x^2} + \frac{2}{x^4} + \frac{5}{x^5} \end{aligned}$$

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$$10) f(x) = \frac{2}{5}x^{-5}$$

$$\begin{aligned} \text{A) } f'(x) &= -2x^{-5} \\ &= -\frac{2}{x^5} \end{aligned}$$

$$\begin{aligned} \text{B) } f'(x) &= \frac{2}{5}x^{-6} \\ &= \frac{2}{5x^6} \end{aligned}$$

$$\begin{aligned} \text{C) } f'(x) &= -2x^{-6} \\ &= -\frac{2}{x^6} \end{aligned}$$

$$\text{D) } f'(x) = -2x$$

$$12) f(x) = -\frac{2}{3}x^{-2} + \frac{1}{2}x^{-5}$$

$$\begin{aligned} \text{A) } f'(x) &= \frac{4}{3}x^{-2} - \frac{5}{2}x^{-5} \\ &= \frac{4}{3x^2} - \frac{5}{2x^5} \end{aligned}$$

$$\begin{aligned} \text{B) } f'(x) &= \frac{4}{3}x - \frac{5}{2}x \\ &= \frac{4x}{3} - \frac{5x}{2} \end{aligned}$$

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