

# Calculus Differentiation Examples

## MEMO

$$\textcircled{1} \quad y = \frac{2}{\sqrt{x^3}} - \frac{2}{\sqrt[4]{x^2}} + 2x^{-3}$$

$$y = \frac{2}{x^{\frac{3}{2}}} - \frac{2}{x^{\frac{1}{2}}} + 2x^{-3}$$

$$y = 2x^{-\frac{3}{2}} - 2x^{-\frac{1}{2}} + 2x^{-3}$$

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

$$\frac{dy}{dx} = \frac{-3}{x^{\frac{5}{2}}} + \frac{1}{x^{\frac{3}{2}}} - \frac{6}{x^4}$$

$$\textcircled{2} \quad y = \frac{2x^3 - 4x + 6}{x^{\frac{1}{2}}}$$

$$y = \frac{2x^3}{x^{\frac{1}{2}}} - \frac{4x}{x^{\frac{1}{2}}} + \frac{6}{x^{\frac{1}{2}}}$$

$$y = 2x^{\frac{5}{2}} - 4x^{\frac{1}{2}} + 6x^{-\frac{1}{2}}$$

$$\frac{dy}{dx} = 5x^{\frac{3}{2}} - 2x^{-\frac{1}{2}} - 3x^{-\frac{3}{2}}$$

$$\frac{dy}{dx} = 5x^{\frac{3}{2}} - \frac{2}{x^{\frac{1}{2}}} - \frac{3}{x^{\frac{3}{2}}}$$

③

$$y = \left( \frac{3}{x} + 4\sqrt{x} \right)^2$$

$$y = \left( \frac{3}{x} + 4x^{\frac{1}{2}} \right) \left( \frac{3}{x} + 4x^{\frac{1}{2}} \right) \checkmark$$

$$y = \frac{9}{x^2} + \frac{12x^{\frac{1}{2}}}{x} + \frac{12x^{\frac{1}{2}}}{x} + 16x \checkmark$$

$$y = 9x^{-2} + 12x^{-\frac{1}{2}} + 12x^{-\frac{1}{2}} + 16x \checkmark$$

$$\frac{dy}{dx} = -18x^{-3} - 6x^{-\frac{3}{2}} - 6x^{-\frac{3}{2}} + 16 \checkmark$$

$$\frac{dy}{dx} = \frac{-18}{x^3} - \frac{12}{x^{\frac{3}{2}}} + 16 \checkmark$$

④

$$y = \frac{2x^2 + 5x - 12}{2x - 3}$$

$$y = \frac{(2x-3)(x+4)}{2x-3} \checkmark$$

$$y = x + 4 \checkmark$$

$$\frac{dy}{dx} = 1 \checkmark$$