

7장 연습문제

1.

$$(a) \frac{\Delta y}{\Delta x} = \frac{f(3) - f(1)}{3 - 1} = 7$$

$$(b) \frac{\Delta y}{\Delta x} = \frac{f(4) - f(2)}{4 - 2} = 11$$

$$(c) \frac{\Delta y}{\Delta x} = \frac{f(3) - f(4)}{3 - 4} = 13$$

3.

$$(a) f'(x) = \frac{1}{7} x^{-\frac{6}{7}}$$

$$(b) g'(x) = \frac{9}{5} x^{\frac{4}{5}}$$

$$(c) h'(x) = -3\pi x^{-3\pi - 1}$$

$$(d) k'(x) = -\sqrt{5} x^{-\sqrt{5} - 1}$$

5.

$$(a) y' = 4(3x^4 + 2x)^3(12x^3 + 2)$$

$$(b) y' = -60x^2(-4x^3 + 2)^4$$

$$(c) y' = 3(x^2 + \sqrt{x} + 1)^2(2x + \frac{1}{2}x^{-\frac{1}{2}})$$

$$(d) y' = 6(4x^2 - \frac{1}{x})^5(8x + \frac{1}{x^2})$$

7.

$$(a) y' = (3x^2 + 7)e^{x^3 + 7x + 1}$$

$$(b) y' = (\frac{1}{2})^x \ln \frac{1}{2}$$

$$(c) y' = 4^{x + \frac{1}{x^2}} (1 - \frac{2}{x^3}) \ln 4$$

$$(d) y' = 5^{\sqrt{x} - \frac{1}{x}} (\frac{1}{2}x^{-\frac{1}{2}} + \frac{1}{x^2}) \ln 5$$

9.

$$(a) y' = 8x \cos(4x^2 - 1)$$

$$(b) y' = -(1 + 2x) \sin(1 + x + x^2)$$

$$(c) y' = \sec^2(\sin x) \cos x$$

$$(d) y' = \cos(\cos x)(-\sin x)$$

11.

(a) $\frac{dy}{dx} = \frac{2x^3}{3y^2}$

(b) $\frac{dx}{dy} = \frac{3y^2 + 2y}{2x + 1}$

(c) $\frac{dy}{dx} = \frac{3x^2 + 2xy^2}{-2x^2y + 4y^3}$

(d) $\frac{dx}{dy} = \frac{-2x^2y + 4y^3}{3x^2 + 2xy^2}$

13.

$$\frac{dy}{dx} = \frac{2 \sin \theta}{2(1 - \cos \theta)} \text{ 이므로 } \theta = \frac{\pi}{3} \text{ 일 때 } \frac{dy}{dx} = \sqrt{3} \text{ 이다.}$$