

$$\textcircled{1} \sin(3-2y) = xy^5$$
$$y' = ?$$

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

$$\textcircled{3} g(x) = x^2 - 4x$$
$$g'(x) = 8$$
$$x = ?$$

$$\textcircled{4} y = \frac{x-1}{x+4}$$
$$y'' = ?$$

$$\textcircled{1} \cos(3-2y)(-2y') = (1)(y^5) + (x)(5y^4)y'$$

$$-2y' \cos(3-2y) = y^5 + 5xy^4 y'$$
$$-5xy^4 y' - 2y' \cos(3-2y) = y^5$$

$$y'(-5xy^4 - 2\cos(3-2y)) = y^5$$

$$y' = \frac{y^5}{-5xy^4 - 2\cos(3-2y)}$$

$$\textcircled{2} f(x) = x^3 - 3x^{-1}$$

$$f'(x) = 3x^2 + 3x^{-2}$$

$$f'(x) = 3x^2 \cdot \frac{x^3}{x^2} + \frac{3}{x^2}$$

$$f'(x) = \frac{3x^4 + 3}{x^2}$$

$$f'(3) = \frac{3(3)^4 + 3}{(3)^2} = \frac{246}{9} = \boxed{\frac{82}{3}}$$

$$\textcircled{3} g(x) = x^2 - 4x$$

$$g'(x) = 2x - 4$$

$$8 = 2x - 4$$

$$\frac{12}{2} = \frac{2x}{2} \quad \boxed{x=6}$$

$$\textcircled{4} y = \frac{x-1}{x+4}$$

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

$$y'' = -10(x+4)^{-3} = \boxed{\frac{-10}{(x+4)^3}}$$