Kapitel 3.2

①

$f(x) = 4 - x^2$ $\qquad$ $f'(-3), f'(0), f'(1)$

$f'(x) = -2x$

$f'(-3) = -2 \cdot (-3) = 6$

$f'(0) = 0$

$f'(1) = -2$

②

$g(t) = \frac{1}{t^2}$ $\qquad$ $g'(-1), g'(2), g'(\sqrt{3})$

$g'(t) = \left[\frac{u}{v}\right]' = \frac{u'v - uv'}{v^2} = \frac{0 \cdot t^2 - 1 \cdot 2t}{t^4} = \frac{0 - 2t}{t^4} = \frac{-2t}{t^4} = -\frac{2}{t^3}$

$u' = 0$

$v' = 2t$

$g'(-1) = -\frac{2}{(-1)^3} = 2$

$g'(2) = -\frac{2}{2^3} = -\frac{2}{8} = -\frac{1}{4}$

$g'(\sqrt{3}) = -\frac{2}{\sqrt{3}^3} = -\frac{2}{3\sqrt{3}}$

⑤

$f(x) = x + \frac{9}{x}$ $\qquad$ $x = -3$

$f'(x) = 1 - \frac{9}{x^2}$

$f'\left(\frac{9}{x}\right) = \left[\frac{u}{v}\right]' = \frac{u'v - uv'}{v^2} = \frac{0 \cdot x - 9 \cdot 1}{x^2} = -\frac{9}{x^2}$

$\qquad 9 = u' = 0$

$\qquad x = v' = 1$

$\qquad\qquad f'(-3) = 1 - \frac{9}{(-3)^2} = 1 - 1 = \underline{0}$

$f'(x) = 1$

⑥

$S = t^3 - t^2 \qquad t = -1$

$S' = 3t^2 - 2t$

$S'(-1) = 3 \cdot (-1)^2 - 2 \cdot (-1) = 3 \cdot 1 - (-2) = \underline{\underline{5}}$