

$$(1) y = (2x-3)(x-2)$$

$$y' = 4x - 7$$

$$(3) y = \frac{1}{x+1}$$

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

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

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

$$(7) y = (x-1)^2$$

$$y' = 2(x-1)$$

$$(9) y = (x^2+2x+3)^2$$

$$y' = 2(x^2+2x+3)(2x+2)$$
$$= 4(x+1)(x^2+2x+3)$$

$$(11) y = x^{\frac{3}{5}} \quad y' = \frac{3}{5}x^{-\frac{2}{5}}$$

$$(13) y = \sqrt{x^2+2x+3} = (x^2+2x+3)^{\frac{1}{2}}$$

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

$$(15) y = \frac{x}{(1+x^3)^2}$$

$$y' = \frac{(1+x^3)^2 - x \cdot 2(1+x^3) \cdot 3x^2}{(1+x^3)^4}$$
$$= \frac{(1+x^3) - 6x^3}{(1+x^3)^3}$$
$$= \frac{1-5x^3}{(1+x^3)^3}$$

$$(2) y = (3x^2+2)(x^2-4x+5)$$

$$y' = 6x(x^2-4x+5) + (3x^2+2)(2x-4)$$
$$= 6x^3 - 24x^2 + 30x + 6x^3 - 8x^2 - 8$$
$$= 12x^3 - 32x^2 + 30x - 8$$

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

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

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

$$y' = \frac{(2x-1) \cdot x^3 - (x^2-x-2) \cdot 3x^2}{x^6}$$
$$= \frac{(2x^2-x) - (3x^2-3x-6)}{x^4} = -\frac{x^2-2x-6}{x^4}$$

$$(8) y = (2x-1)(x-2)^2$$

$$y' = 2(x-2)^2 + (2x-1) \cdot 2(x-2)$$
$$= 2(x-2)\{(x-2) + (2x-1)\} = 6(x-2)(x-1)$$

$$(10) y = \left(x + \frac{1}{x}\right)^3$$

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

$$(12) y = \frac{1}{\sqrt[4]{x^3}} = x^{-\frac{3}{4}}$$

$$y' = -\frac{3}{4}x^{-\frac{7}{4}} = -\frac{7}{4 \cdot \sqrt[4]{x^7}}$$

$$(14) y = \frac{1}{\sqrt{x^2+3}} = (x^2+3)^{-\frac{1}{2}}$$

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

$$(16) y = \frac{x}{\sqrt{1-x^2}} \quad (\sqrt{1-x^2})' = ((1-x^2)^{\frac{1}{2}})'$$
$$y' = \frac{\sqrt{1-x^2} - x \cdot \left(-\frac{x}{\sqrt{1-x^2}}\right)}{1-x^2} = \frac{1}{2} (1-x^2)^{-\frac{1}{2}} \cdot (-2x)$$
$$= -\frac{x}{\sqrt{1-x^2}}$$
$$= \frac{\sqrt{1-x^2} + \frac{x^2}{\sqrt{1-x^2}}}{1-x^2} \quad \left. \begin{array}{l} \text{分母分子に} \\ \sqrt{1-x^2} \text{ をかける} \end{array} \right\}$$
$$= \frac{(1-x^2) + x^2}{(1-x^2)\sqrt{1-x^2}} = \frac{1}{(1-x^2)\sqrt{1-x^2}}$$