

⑤ 次の関数を微分せよ。

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

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

(2)  $y = \frac{2}{5x+3}$

$$y' = -\frac{10x}{(5x+3)^2}$$

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

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

$$= \frac{x^2+6x+1}{(x+3)^2}$$

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

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

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

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

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

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

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

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

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

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

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

$$= \frac{2x^2-6x+5}{(2x-3)^2}$$

⑥ 次の関数を微分せよ。

(1)  $y = \frac{1}{3x-4}$

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

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

$$y' = \frac{18x^2}{(2x^3+1)^2}$$

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

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

$$= \frac{-x^2+2x-3}{(x^2+2x-5)^2}$$

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

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

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

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

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

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

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

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

$$= \frac{-x^2-8x-2}{(x^2-2)^2}$$

(7)  $y = \frac{x}{x^4-8x^2+15}$

$$y' = \frac{1 \cdot (x^4-8x^2+15) - x(4x^3-16x)}{(x^4-8x^2+15)^2}$$

$$= \frac{-3x^4+8x^2+15}{(x^4-8x^2+15)^2}$$