

問題

問題 1. 次の関数を微分せよ。

(1) $y = 2x^5 + 6x^3$

(2) $y = 2x^6 - 5x^2$

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

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

問題 2. 次の関数を微分せよ。

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

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

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

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

問題 3. 次の関数を微分せよ。

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

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

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

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

問題 4. 次の関数を微分せよ。

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

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

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

(4) $y = \frac{1}{(4x + 5)^3}$

問題 5. 次の関数を微分せよ。

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

(2) $y = (5 - 6x^2)^3$

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

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

練習

練習 1. 次の関数を微分せよ。

$$(1) y = 3x^6 - 2x^2$$

$$(2) y = 5x^7 + 5x^4$$

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

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

練習 2. 次の関数を微分せよ。

$$(1) y = \frac{1}{5x + 4}$$

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

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

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

練習 3. 次の関数を微分せよ。

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

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

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

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

練習 4. 次の関数を微分せよ。

$$(1) y = (3x + 4)^5$$

$$(2) y = (6x - 1)^3$$

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

$$(4) y = \frac{1}{(2x + 7)^2}$$

練習 5. 次の関数を微分せよ。

$$(1) y = (4x^2 - 1)^4$$

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

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

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

解答

問題 1.

$$(1) y' = 10x^4 + 18x^2 \quad (2) y' = 12x^5 - 10x \quad (3) y' = 3x^2 + 6x + 3$$

$$(4) y' = 8x^3 - 18x^2 + 10x - 3$$

問題 2.

$$(1) y' = -\frac{2}{(2x+5)^2} \quad (2) y' = -\frac{4}{(4x-1)^2} \quad (3) y' = -\frac{3x^2+2x+9}{(x^2-3)^2}$$

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

問題 3.

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

問題 4.

$$(1) y' = 8(2x+3)^3 \quad (2) y' = 15(5x-3)^2 \quad (3) y' = -\frac{6}{(3x-1)^3}$$

$$(4) y' = -\frac{12}{(4x+5)^4}$$

問題 5.

$$(1) y' = 24x(3x^2+4)^3 \quad (2) y' = -36x(5-6x^2)^2 \quad (3) y' = \frac{16x}{(3-4x^2)^3}$$

$$(4) y' = -\frac{30x}{(5x^2-6)^4}$$

解答

練習 1.

$$(1) y' = 18x^5 - 4x \quad (2) y' = 35x^6 + 20x^3 \quad (3) y' = 3x^2 - 4x + 3$$

$$(4) y' = 5x^4 + 4x^3 + 3x^2 + 2x + 1$$

練習 2.

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

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

練習 3.

$$(1) y' = -\frac{4}{x^5} \quad (2) y' = -\frac{6}{x^7} \quad (3) y' = -\frac{6}{x^3} \quad (4) y' = \frac{6}{x^4}$$

練習 4.

$$(1) y' = 15(3x+4)^4 \quad (2) y' = 18(6x-1)^2 \quad (3) y' = -\frac{12}{(4x-3)^4}$$

$$(4) y' = -\frac{4}{(2x+7)^3}$$

練習 5.

$$(1) y' = 32x(4x^2-1)^3 \quad (2) y' = -18x(1-3x^2)^2 \quad (3) y' = \frac{20x}{(2-5x^2)^3}$$

$$(4) y' = -\frac{18x}{(3x^2+4)^4}$$