

1 微分/整関数

次の関数を微分せよ.

$$(1) f(x) = 2x^8 + 4x^2 + 5x - 8$$

$$(2) f(x) = -x^3 + x^2 - 2x - 3$$

$$(3) f(x) = -5x^2 + 5x + 6$$

$$(4) f(x) = -2x^8 - x^4 + 4$$

$$(5) f(x) = -x^3 - 3x^2 - 4x - 7$$

$$(6) f(x) = 3x^2 + 4x + 5$$

$$(7) f(x) = -x^{10} + x^6 + 3x^2 - 7$$

$$(8) f(x) = -x^3 + 4x^2 - 5$$

$$(9) f(x) = -x^3 - x^2 + 7$$

$$(10) f(x) = 4x^2 - 2x$$

2 微分/整関数の微分

次の関数を微分せよ.

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

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

$$(3) f(x) = \sqrt[4]{x}$$

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

$$(5) f(x) = \sqrt[10]{x}$$

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

$$(7) f(x) = \frac{1}{\sqrt{x}}$$

3 微分/積の微分

次の関数を微分せよ.

$$(1) f(x) = (x - 2)(4x + 7)$$

$$(2) f(x) = (x - 5)(x + 6)$$

$$(3) f(x) = (2x - 3)(x + 4)$$

$$(4) f(x) = x(2x - 3)$$

$$(5) f(x) = (2x + 7)(2x^2 + x + 2)$$

$$(6) f(x) = (x - 3)(x^2 + 3x + 1)$$

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

$$(8) f(x) = (4x - 9)(x^2 + 3x + 7)$$

$$(9) f(x) = (2x + 5)(2x^2 + x - 6)$$

$$(10) f(x) = (x - 2)(2x^2 + 3x - 4)$$

4 微分/商の微分 1

次の関数を微分せよ.

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

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

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

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

$$(5) f(x) = \frac{x+3}{x-1}$$

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

$$(7) f(x) = \frac{3x+1}{x^2+5}$$

$$(8) f(x) = \frac{x-3}{x^2-x}$$

$$(9) f(x) = \frac{3x}{x^2 + 2x - 3}$$

$$(10) f(x) = \frac{x+3}{\sqrt{x}}$$

$$(11) f(x) = \frac{3x^2 - 2x + 3}{\sqrt{x}}$$

5 微分/商の微分2

次の関数を微分せよ.

$$(1) f(x) = \frac{1}{2x}$$

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

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

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

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

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

$$(7) f(x) = \frac{1}{x^2-x-2}$$

$$(8) f(x) = \frac{1}{x^2+3x-4}$$

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

$$(10) f(x) = \frac{1}{x^2 - 3x}$$

6 微分/合成関数の微分

次の関数を微分せよ.

$$(1) f(x) = (x^2 + 2)^7$$

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

$$(3) f(x) = (x + 1)^3$$

$$(4) f(x) = (x^2 + x + 1)^6$$

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

$$(6) f(x) = (x^2 + 3x - 1)^8$$

$$(7) f(x) = (x^2 - 1)^5$$

$$(8) f(x) = \frac{1}{(x^2 + 1)^5}$$

$$(9) f(x) = \frac{1}{\sqrt{x^2 + 1}}$$

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

$$(11) f(x) = (x - 3)^3(x + 5)^4$$

$$(12) f(x) = (2x^2 + 5)^3(x^2 - 5)^7$$

7 微分/三角関数

次の関数を微分せよ.

$$(1) f(x) = \sin(2x)$$

$$(2) f(x) = \cos(x - 1)$$

$$(3) f(x) = \frac{1}{\sin x}$$

$$(4) f(x) = \tan(\sqrt{x})$$

$$(5) f(x) = \frac{1}{\tan x}$$

$$(6) f(x) = \cos(x^2 - x + 2)$$

$$(7) f(x) = \sin(x^2 - 2x - 2)$$

$$(8) f(x) = \cos(2x^2 - 1)$$

$$(9) f(x) = \sin^2(x + 4)$$

$$(10) f(x) = \cos^3(x^2 + 1)$$

$$(11) f(x) = \sin^2(2x^2 + x - 1)$$

8 微分/指数関数

次の関数を微分せよ.

(1) $f(x) = e^{x-2}$

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

(3) $f(x) = e^{x^2+3x+5}$

(4) $f(x) = 3^x$

(5) $f(x) = 5^{3x+4}$

(6) $f(x) = 3^{x^3-1}$

$$(7) f(x) = xe^x$$

9 微分/対数関数

次の関数を微分せよ.

$$(1) f(x) = \log(x^2 + 2)$$

$$(2) f(x) = \log|x^2 - 2|$$

$$(3) f(x) = \log(2x^2 + 3x + 4)$$

$$(4) f(x) = \log|x^2 + x - 2|$$

$$(5) f(x) = \log_5|2x - 1|$$

$$(6) f(x) = \log_2 |3x - 1|$$

$$(7) f(x) = \log_a |2x^2 - 2x - 1| \quad (a > 0, a \neq 1)$$

$$(8) f(x) = x^2 \log x \quad (x > 0)$$

10 微分/いろいろ

次の関数を微分せよ.

$$(1) f(x) = \sin^2(2x)$$

$$(2) f(x) = e^{x \log x}$$

(3) $f(x) = \cos(\sin x)$

(4) $f(x) = \sqrt{1 + \sin^2 x}$

(5) $f(x) = \cos^3(2x^2 + x + 2)$

(6) $f(x) = e^{-2x} \sin 2x$

$$(7) f(x) = \sqrt[3]{x^2 + 1}$$

$$(8) f(x) = \log \left| \frac{2x - 1}{2x + 1} \right|$$

$$(9) f(x) = \sin^5 x \cos 5x$$

$$(10) f(x) = \log \frac{|x|}{1 + \cos x}$$

$$(11) f(x) = \frac{1}{\tan^3(2x)}$$

$$(12) f(x) = \frac{1 - \tan x}{1 + \tan x}$$

11 微分/対数微分法

次の関数を微分せよ.

$$(1) f(x) = x^{\log x} \quad (x > 0)$$

$$(2) f(x) = (\log x)^x \quad (x > 1)$$

$$(3) f(x) = (2x - 1)^4(3 - x)^3$$

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

$$(5) f(x) = \frac{(x + 1)^2}{(x + 2)^3(x + 3)^4}$$

$$(6) f(x) = x^{\sin x} \quad (x > 0)$$

$$(7) f(x) = \sqrt[3]{(x-2)(x^2-2)}$$

$$(8) f(x) = x^{e^x} \quad (x > 0)$$