

## 【微分法の復習】

1. 次の関数を, 定義に従って微分せよ。

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

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

2. 次の関数を微分せよ。

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

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

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

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

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

3. 次の関数を微分せよ。

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

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

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

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

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

4.  $y$  が  $x$  の関数で, 次の関係式が成り立つとき,  $\frac{dy}{dx}$  を求めよ。

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

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

① 次の関数を微分せよ。

(1)  $y = 2\cos x + 3x$

(2)  $y = \sin x - 3\tan x$

(3)  $y = \sin(3x+2)$

(4)  $y = \cos(1-2x)$

(5)  $y = \sin^4 x$

(6)  $y = 2\cos^3 x$

(7)  $y = \tan(\cos x)$

(8)  $y = \sin(\cos x)$

(9)  $y = 2x\sin 2x$

(10)  $y = x^3\tan 3x$

(11)  $y = \sin x \cos 2x$

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

(13)  $y = \frac{\sin x}{1 + \cos x}$

(14)  $y = \frac{\cos x}{1 - \sin x}$

② 次の関数を微分せよ。

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

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

(3)  $y = \sin^2 x \cos^2 x$

(4)  $y = \sqrt{1 + \cos 2x}$

(5)  $y = x^3 \sin^2 4x$

(6)  $y = 3x \cos^3 2x$

(7)  $y = x^2 \sin 3x^2$

(8)  $y = \left( \tan x + \frac{1}{\tan x} \right)^2$

(9)  $y = \sin \sqrt{x^2 - x + 1}$