演習　微分_第 06 回

学年[2]年　学科[MI・AC・BC]　番号[　　]　氏名　[　　]

問 4.8　次の関数を微分せよ。

(1) $y = \mathrm{Sin}^{-1}3x$

$$y' = \frac{3}{\sqrt{1-(3x)^2}} = \frac{3}{\sqrt{1-9x^2}}$$

(2) $y = \mathrm{Cos}^{-1}\dfrac{x}{3}$

$$y' = \frac{-\frac{1}{3}}{\sqrt{1-\left(\frac{x}{3}\right)^2}} = \frac{-1}{\sqrt{9-x^2}}$$

(3) $y = \mathrm{Tan}^{-1}\dfrac{x}{3}$

$$y' = \frac{\frac{1}{3}}{\left(\frac{x}{3}\right)^2+1} \quad \begin{matrix}\times 9\\ \times 9\end{matrix} = \frac{3}{x^2+9}$$

問 4.9　次の関数を微分せよ。

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

$$y' = 4(2x+3)^3 \times 2 = 8(2x+3)^3$$

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

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

(3) $y = \dfrac{1}{\cos x}$

$$y' = -\frac{-\sin x}{\cos^2 x} = \frac{\sin x}{\cos^2 x}$$

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

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

(5) $y = \log(x^2-x+1)$

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

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

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

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

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

(8) $y = \tan(2x+3)$

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

(9) $y = e^{2x}\cos 3x$

$$y' = 2e^{2x} \times \cos 3x + e^{2x} \times (-3\sin 3x)$$
$$= e^{2x}(2\cos 3x - 3\sin 3x)$$

(10) $y = \dfrac{e^{2x}}{\sin 3x}$

$$y' = \frac{2e^{2x} \times \sin 3x - e^{2x} \times 3\cos 3x}{\sin^2 3x}$$
$$= \frac{e^{2x}(2\sin 3x - 3\cos 3x)}{\sin^2 3x}$$

(11) $y = \{\log(2x+3)\}^6 = u^6$

$$y' = 6u^5 \times u' = 6\{\log(2x+3)\}^5 \times \frac{2}{2x+3}$$
$$= \frac{12\{\log(2x+3)\}^5}{2x+3}$$

(12) $y = \cos^5 2x = u^5$

$$y' = 5u^4 \times u' = 5\cos^4 2x \times (-2\sin 2x)$$
$$= -10\cos^4 2x \sin 2x$$