

微分おさらいテスト NO1

学籍番号

氏名

問1 次の関数を微分せよ.

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

$$y' = 3 \cdot 2x^{2-1} = 6x$$

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

$$y' = 2 \cdot 3x^{3-1} + 3 \cdot 2x^{2-1} - 1 \cdot x^{1-1} = 6x^2 + 6x - 1$$

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

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

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

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

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

$$= 2(x^2 + 2x) + (2x + 1)(2x + 2) = 6x^2 + 10x + 2$$

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

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

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

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

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

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

$$(8)y = \frac{1}{x^3}$$

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

$$(9)y = \sqrt{x}$$

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

$$(10)y = \sqrt{4 - x^2}$$

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

$$(11)y = (x^3 + 1)^2$$

$$y' = 2(x^3 + 1)^{2-1}(x^3 + 1)' = 6x^2(x^3 + 1)$$

$$(12)y = \frac{1}{(x^2 + 1)^3}$$

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

$$(13)y = \sin(2x - 3)$$

$$y' = \cos(2x - 3)(2x - 3)' = 2\cos(2x - 3)$$

$$(14)y = \cos^2 x$$

$$y' = 2\cos^{2-1}x(\cos x)' = -2\sin x \cos x = -\sin 2x$$

$$(15)y = \frac{1}{\tan x}$$

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

$$(16)y = \varepsilon^{2x}$$

$$y' = \varepsilon^{2x}(2x)' = 2\varepsilon^{2x}$$

$$(17)y = \varepsilon^x - \varepsilon^{-x}$$

$$y' = \varepsilon^x(x)' - \varepsilon^{-x}(-x)' = \varepsilon^x + \varepsilon^{-x}$$