



1



次の式を微分しなさい。

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

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

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

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

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

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

$y' = 6(x^2 - 4x + 3)^2(x - 2)$

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

$= 3(x+4)^2(1-2x)^3 - 6(x+4)^3(1-2x)^2$

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

$= (x+4)^2(1-2x)^2(-12x-21)$

$y' = -3(4x+7)(x+4)^2(1-2x)^2$

(3) $y' = (2x-1)(3x^2-2)^2 + 2(x^2-x+3)(3x^2-2) \cdot 6x$

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

$y' = (3x^2-2)(18x^3-15x^2+32x+2)$

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

$y' = \frac{-x^2+6x-7}{(x-1)^2(x-2)^2}$

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

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

