

$$\textcircled{1} f(x) = x^5 - 2x^3 + 4x^7$$

$$\underline{f'(x) = 5x^4 - 6x^2 + 28x^6}$$

$$\therefore v(x) \circ v(x)$$

$$\therefore U(x) \circ v'(x) + v(x) \circ U'(x)$$

$$U = 5$$

$$v = (x^4 - 3x^3)^2$$

$$U' = 0$$

$$v' = 8x^7 - 42x^6 + 54x^5$$

$$\textcircled{3} f(x) = (12x)(3x-2)^5$$

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

$$\frac{d}{dx} U^n = nU^{n-1} \cdot U'$$

$$U = 3x - 2$$

$$n = 5$$

$$U' = 3$$

$$f'(x) = 5(3x-2)^{5-1} \cdot 3$$

$$f'(x) = 5(3x-2)^4 \cdot 3$$

$$= 15(3x-2)^4$$

$$\underline{= 12x[15(3x-2)^4] + (3x-2)^5 \cdot 12}$$

$$\textcircled{2} f(x) = (5)(x^4 - 3x^3)^2$$

$$\frac{d}{dx} U^n = nU^{n-1} \cdot U'$$

$$U = (x^4 - 3x^3)$$

$$n = 2$$

$$U' = 4x^3 - 9x^2$$

$$2(x^4 - 3x^3)(4x^3 - 9x^2)$$

$$2(x^4 - 3x^3)(4x^3 - 9x^2)$$

$$8x^7 - 18x^6 - 24x^6 + 54x^5$$

$$\rightarrow 8x^7 - 42x^6 + 54x^5$$

$$= (5)(8x^7 - 42x^6 + 54x^5) + (x^4 - 3x^3) \cdot 0$$

$$\underline{= 40x^7 - 210x^6 + 270x^5}$$

$$U(x) \circ v(x)$$

$$U(x) \circ v'(x) + v(x) \circ U'(x)$$

$$\leftarrow U = 12x$$

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

$$U' = 12$$

$$v' = 15(3x-2)^4$$

Integrals

$$\begin{aligned} \textcircled{1} \int (26x^3 + 20x^2 + 25x - 5x) dx \\ &= 26 \int x^3 dx + 20 \int x^2 dx + 20 \int x dx \\ &= 26 \frac{x^4}{4} + 20 \frac{x^3}{3} + 20 \frac{x^2}{2} \\ &= 13 \frac{x^4}{2} + 20 \frac{x^3}{3} + 10x^2 + C \end{aligned}$$

$$\textcircled{2} \int (2x+10)^4 dx$$

$$u = 2x + 10$$

$$du = 2 dx$$

$$\frac{du}{2} = dx$$

$$\int u^3 \frac{du}{2} = \frac{1}{2} \int u^3 du$$

$$= \frac{1}{2} \left(\frac{u^4}{4} \right) + C = \frac{u^4}{8} + C$$

$$= \frac{1}{8} (2x+10)^4 + C$$

$$\textcircled{3} \int (13-10)^4 dx$$

$$= (3)^4 = \int 81 dx$$

$$= 81 \int dx + C$$

$$= 81x + C$$

formula

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

①



②



③

