

$$\textcircled{1} \frac{1}{b-a} \int_a^b f(x) dx$$

$$\frac{1}{3-(-2)} \int_{-2}^3 x^3 - 5x dx$$

$$\frac{1}{5} \left(\frac{x^4}{4} - \frac{5x^2}{2} \Big|_{-2}^3 \right)$$

$$\frac{1}{5} \left(\begin{array}{c} \textcircled{3} \\ \left(\frac{(3)^4}{4} - \frac{5(3)^2}{2} \right) - \left(\frac{(-2)^4}{4} - \frac{5(-2)^2}{2} \right) \end{array} \right)$$

$$\frac{1}{5} \left(\left(\frac{81}{4} - \frac{45}{2} \right) - \left(\frac{16}{4} - \frac{20}{2} \right) \right)$$

$$\frac{1}{5} \left(\left(\frac{81}{4} - \frac{90}{4} \right) - \left(\frac{16}{4} - \frac{40}{4} \right) \right)$$

$$\frac{1}{5} \left(\frac{-9}{4} - \frac{-24}{4} \right)$$

$$\frac{1}{5} \left(\frac{15}{4} \right) = \frac{15}{20} = \textcircled{\frac{3}{4}}$$

$$\textcircled{2} \quad \frac{1}{b-a} \int f(x) dx$$

$$\frac{1}{2\pi - \pi} \int_{\pi}^{2\pi} \sin x dx$$

$$\frac{1}{\pi} \left(-\cos x \Big|_{\pi}^{2\pi} \right)$$

$$\frac{1}{\pi} \left(\textcircled{a} 2\pi - \textcircled{a} \pi \right)$$
$$\frac{1}{\pi} \left((-\cos 2\pi) - (-\cos \pi) \right)$$

$$\frac{1}{\pi} \left((-\cos 360) - (-\cos 180) \right)$$

$$\frac{1}{\pi} \left(-1 - 1 \right)$$

$$\left(\frac{-2}{\pi} \right)$$

$$3) \frac{d}{dx} \left(\int_0^x 6m^2 + 4m^5 \, dm \right)$$

$$\frac{d}{dx} \left(\frac{6m^3}{3} + \frac{4m^6}{6} \Big|_0^x \right)$$

$$\frac{d}{dx} \left(2m^3 + \frac{2m^6}{3} \Big|_0^x \right)$$

$$\frac{d}{dx} \left(\begin{array}{l} @x \\ \left(2x^3 + \frac{2x^6}{3} \right) - \left(2(0)^3 + \frac{2(0)^6}{3} \right) \end{array} \right)$$

$$\frac{d}{dx} \left(2x^3 + \frac{2x^6}{3} \right)$$

$$6x^2 + \frac{12x^5}{3}$$

$$6x^2 + 4x^5$$

$$(4) \frac{d}{dx} \left(\int_x^0 4y^3 - 2y \, dy \right)$$

$$\frac{d}{dx} \left(\frac{4y^4}{4} - \frac{2y^2}{2} \Big|_x^0 \right)$$

$$\frac{d}{dx} \left(y^4 - y^2 \Big|_x^0 \right)$$

$$\frac{d}{dx} \left(\begin{array}{c} @ \swarrow 0 \\ \cancel{((0^4 - 0^2))} - @ x \\ (x^4 - x^2) \end{array} \right)$$

$$\frac{d}{dx} \left(-(x^4 - x^2) \right)$$

$$\frac{d}{dx} \left(-x^4 + x^2 \right)$$

$$\boxed{-4x^3 + 2x}$$

$$(5) \int_a^b (\text{Top Curve}) - (\text{Bottom Curve})$$

$$\int_1^3 (x^2 + 3) - (x + 1) \, dx$$

$$\int_1^3 x^2 + 3 - x - 1 \, dx$$

$$\int_1^3 x^2 - x + 2 \, dx$$

$$\frac{x^3}{3} - \frac{x^2}{2} + 2x \Big|_1^3$$

↙
@ 3

@ 1

$$\frac{(3)^3}{3} - (3)^2 + 2(3)$$

$$\frac{1^3}{3} - \frac{1}{2} + 2$$

$$9 - 9 + 6$$

$$6$$

$$- \frac{11}{6}$$

$$\frac{25}{6}$$

