

TISA XII SERAL

Integrasi Definite

$$\begin{aligned} \textcircled{1} \int_0^2 (x^4 + 2x^3 + 6x^2 - 4x - 3) dx &= \\ &= \left(\frac{x^5}{5} + 2 \frac{x^4}{4} + 6 \frac{x^3}{3} - 4 \frac{x^2}{2} - 3x \right) \Big|_0^2 = \\ &= \frac{2^5}{5} + 2 \cdot \frac{2^4}{4} + 6 \cdot \frac{2^3}{3} - 4 \cdot \frac{2^2}{2} - 3 \cdot 2 - 0 = \\ &= \frac{32}{5} + \frac{15}{1} + \frac{24}{1} - \frac{16}{1} - 6 = \frac{384 + 480 + 960 - 480 - 300}{60} = \\ &= \frac{984}{60} = \frac{166}{10} = \frac{82}{5} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \int_{\frac{\pi}{2}}^{\pi} (4 \sin x + 5 \cos x) dx &= (4(-\cos x) + 5 \sin x) \Big|_{\frac{\pi}{2}}^{\pi} \\ &= -4 \cos \pi + 5 \sin \pi + 4 \cos \frac{\pi}{2} - 5 \sin \frac{\pi}{2} = \\ &= -4(-1) + 5 \cdot 0 + 4 \cdot 0 - 5 \cdot 1 = 4 - 5 = -1 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \int_0^1 e^x (x^2 - 4x + 5) dx &= e^x (x^2 - 4x + 5) \Big|_0^1 - \\ & \left. \begin{aligned} f(x) &= x^2 - 4x + 5 \Rightarrow f'(x) = 2x - 4 \\ g'(x) &= e^x \Rightarrow g(x) = e^x \end{aligned} \right\} \\ &= \int_0^1 e^x (2x - 4) dx = e^x (x^2 - 4x + 5) \Big|_0^1 - e^x (2x - 4) \\ & \quad + \int_0^1 e^x \cdot 2 dx = e^x (x^2 - 4x + 5 - 2x + 4 + 2) \Big|_0^1 \\ &= e^1 (1^2 - 4 \cdot 1 + 5 - 2 \cdot 1 + 4 + 2) - e^0 (5 + 4 + 2) = \\ &= 6e - 11 \end{aligned}$$