

Hw 5.3

$$\textcircled{27} \int_0^2 x(2+x^5) dx = \int_0^2 (2x + x^6) dx$$

$$\neq \frac{x^2}{2} \left( 2x + \frac{x^6}{6} \right)$$

(41)

$$\int_0^{\pi} f(x) dx$$

$$f(x) = \begin{cases} \sin x & 0 \leq x \leq \pi/2 \\ \cos x & \pi/2 \leq x \leq \pi \end{cases}$$

$$\int_0^{\pi/2} \sin x dx + \int_{\pi/2}^{\pi} \cos x dx$$

$$\rightarrow -\cos x \Big|_0^{\pi/2} + \sin x \Big|_{\pi/2}^{\pi}$$

$$-\cancel{\cos \pi/2} + \cos 0 + \cancel{\sin \pi} - \sin \pi/2 = 0$$

$$\textcircled{25} \int_1^2 \frac{3}{t^4} dt$$

$$\int_1^2 3t^{-4} dt$$

$$3 \cdot \frac{t^{-3}}{-3} \Big|_1^2 = - \frac{1}{t^3} \Big|_1^2 = \frac{1}{8} + \frac{1}{1} = \frac{9}{8}$$

(29)  $\int_1^9 \frac{x-1}{\sqrt{x}} dx$

$$\int_1^9 (x^{1/2} - x^{-1/2}) dx$$

$$\therefore \left. \frac{2}{3} x^{3/2} - \frac{2}{1} x^{1/2} \right|_1^9 = \frac{40}{3}$$

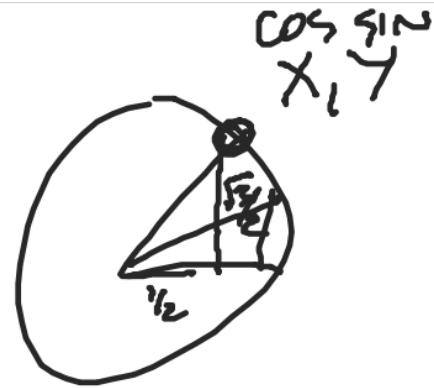
(31)

$$\int \sec^2 t dt$$

$$\int_0^{\pi/4} \sec^2 t dt$$

$$\text{TAN } t$$

$$37 \int_{1/2}^{\sqrt{3}/2} \frac{6}{\sqrt{1-t^2}} dt$$



$$6 \int_{1/2}^{\sqrt{3}/2} \frac{1}{\sqrt{1-t^2}} dt$$

$$\dots 6 \left( \text{ARCSIN} \frac{\sqrt{3}}{2} - \text{ARCSIN} \frac{1}{2} \right)$$

$$6 \left( \frac{\pi}{3} - \frac{\pi}{6} \right) = 6 \left( \frac{2\pi}{6} - \frac{\pi}{6} \right) = 6 \left( \frac{\pi}{6} \right) = \boxed{\pi}$$