$$I = \int_c z^n \bar{z} \cos(z) \, dz \qquad |z| = 1 \qquad (2 \text{ السؤال})$$

$$\Rightarrow z = e^{i\theta} \Rightarrow dz = i e^{i\theta} d\theta$$

$$\bar{z} = e^{-i\theta} \quad , \quad \cos(z) = \frac{e^{i\theta} + e^{-i\theta}}{2}$$

$$\int_0^{2\pi} f(z(t)) \, z'(t)$$

$$I = \int_0^{2\pi} e^{in\theta} \, e^{-i\theta} \, \frac{e^{i\theta} + e^{-i\theta}}{2} \, (i e^{i\theta}) \, d\theta$$

$$= \frac{i}{2} \int_0^{2\pi} \left[e^{i(n+1)\theta} + e^{i(n-1)\theta} \right] d\theta$$

$$= \begin{cases} \pi i & n = -1 \\ \pi i & n = 1 \\ 0 & n \neq \pm 1 \end{cases}$$