

### 1- حساب التكامل الأول

لدينا

$$A = \int_0^{\sqrt{3}} \frac{1}{2} (2t) \sqrt{1+t^2} dt$$

$$= \frac{1}{2} \int_0^{\sqrt{3}} u'(t) \sqrt{u(t)} dt$$

$$\forall t \in \mathbb{R} \quad u(t) = 1 + t^2 \quad \text{حيث}$$

$$A = \frac{1}{2} \left[ \frac{2}{3} u^{3/2}(t) \right]_0^{\sqrt{3}} \quad \text{ومنه}$$

$$= \frac{1}{3} (\sqrt{4^3} - \sqrt{1^3})$$

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$$= \frac{7}{3}$$

### 2- حساب التكامل الثاني

$$B = \int_0^{\sqrt{3}} t^2 \cdot \frac{t}{\sqrt{1+t^2}} dt \quad \text{لدينا}$$

$$= \int_0^{\sqrt{3}} t^2 u'(t) dt$$

$$\forall t \in \mathbb{R} \quad u(t) = \sqrt{1+t^2} \quad \text{حيث}$$

$$B = [t^2 u(t)]_0^{\sqrt{3}} - \int_0^{\sqrt{3}} 2tu(t) dt \quad \text{ومنه} \rightarrow$$

$$= 6 - 2 \int_0^{\sqrt{3}} t \sqrt{t^2 + 1} dt$$

$$= 6 - 2A$$

$$= \frac{4}{3}$$

### 3- حساب التكامل الثالث

$$C = \int_0^{\frac{\pi}{2}} \sin t (1 - \cos^2 t) dt \quad \text{لدينا}$$

$$= \int_0^{\frac{\pi}{2}} \sin t dt + \int_0^{\frac{\pi}{2}} (-\sin t) \cos^2 t dt$$

$$= [-\cos t]_0^{\frac{\pi}{2}} + \left[ \frac{1}{3} \cos^3 t \right]_0^{\frac{\pi}{2}}$$

$$= 1 - \frac{1}{3}$$

$$= \frac{2}{3}$$



Achamel