

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

$$= \frac{1}{2} \left[\frac{1}{\frac{1}{2}+1} (1+t^2)^{\frac{1}{2}+1} \right]_0^{\sqrt{3}} = \frac{1}{3} [(1+t^2) \sqrt{1+t^2}]_0^{\sqrt{3}}$$

$$A = \frac{7}{3} \quad \text{إذن}$$

$\frac{2t}{2}$

$$u'(t) = 2t \quad ; \quad u(t) = t^2 \quad \text{نضع (2)}$$

$$v(t) = \sqrt{1+t^2} \quad ; \quad v'(t) = \frac{t}{\sqrt{1+t^2}}$$

$$B = [t^2 \sqrt{1+t^2}]_0^{\sqrt{3}} - 2 \int_0^{\sqrt{3}} t \sqrt{1+t^2} \, dt \quad \text{إذن}$$

$$= 6 - 2 \cdot A = \frac{4}{3}$$

$$C = \int_0^{\frac{\pi}{2}} \sin^3 t \, dt = \int_0^{\frac{\pi}{2}} \sin t (1 - \cos^2 t) \, dt \quad (3)$$

$$= \int_0^{\frac{\pi}{2}} \sin t \, dt - \int_0^{\frac{\pi}{2}} \cos^2 t \cdot \sin t \, dt$$

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

$$C = \frac{2}{3} \quad \text{إذن}$$

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