

$$= \sqrt{2} \int_0^{\frac{\pi}{2}} (-2 \sin \theta - 2 \cos^2 \theta \sin \theta + \cancel{\cos^2 \theta \sin \theta}) d\theta + \quad (7)$$

$$\sqrt{2} \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 4 \sin^2 \theta \cos \theta d\theta =$$

$$= -4\sqrt{2} - \frac{2}{3}\sqrt{2} + \frac{8}{3}\sqrt{2} = -2\sqrt{2}$$