

a 2

7dinto

$$\int 4 \cos \theta \cos^5(\sin \theta) d\theta$$

$$\text{let } u = \sin \theta.$$

$$du = \cos \theta d\theta$$

$$\begin{aligned} \int 4 \cos \theta \cos^5(\sin \theta) d\theta &= \int 4 \cos^5 u du \\ &= \int 4 (\cos^2 u)^2 \cos u du \\ &= \int 4 (1 - \sin^2 u)^2 \cos u du \end{aligned}$$

$$= \int 4 (1 - 2 \sin^2 u + \sin^4 u) \cos u du$$

$$\text{Let } x = \sin u ; \quad dx = \cos u du$$

$$\begin{aligned} \int &= \int 4 (1 - 2x^2 + x^4) dx \\ &= 4x - \frac{8}{3} x^3 + \frac{4}{5} x^5 + C \\ &= 4 \sin u - \frac{8}{3} \sin^3 u + \frac{4}{5} \sin^5 u + C \\ &= 4 \sin(\sin \theta) - \frac{8}{3} \sin^3(\sin \theta) + \frac{4}{5} \sin^5(\sin \theta) + C \end{aligned}$$