

$$I = \int \sin^3 x \cos^2 x \, dx \quad \begin{cases} m=3 \leftarrow \\ n=2 \end{cases}$$

$$\sin^2 x + \cos^2 x = 1 \quad \begin{cases} \sin^2 x = 1 - \cos^2 x \\ \cos^2 x = 1 - \sin^2 x \end{cases}$$

$$\int \sin^m x \cdot \cos^n x \cdot dx \quad \underline{\underline{m=\text{impar}}}$$

m y n enteros no negativos
(positivos o cero)

Nuestro objetivo es tener el integrando en función del $\cos x$

$$\sin^3 x = \sin^2 x \cdot \sin x = (1 - \cos^2 x) \cdot \sin x$$

$$I = \int (1 - \cos^2 x) \cdot \sin x \cdot \cos^2 x \, dx$$

$$d(\cos x) = -\sin x \, dx$$

$$-d(\cos x) = \sin x \, dx$$

$$I = \int (1 - \cos^2 x) \cdot \cos^2 x \cdot (-d(\cos x))$$

$$\cos x = u$$

$$\cos^2 x = u^2$$

$$I = \int (1 - u^2) \cdot u^2 \cdot (-du) =$$

$$= \int (u^2 - u^4) (-du) = \int (u^4 - u^2) du =$$

$$= \int u^4 du - \int u^2 du = \frac{u^5}{5} - \frac{u^3}{3} + C =$$

$$I = \frac{\cos^5 x}{5} - \frac{\cos^3 x}{3} + C$$

Integral inmediata