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

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

m y n enteros no negativos (positivos ó cero)

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

Nuestro objetivo es tener el integrando en función del cos x

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

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

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

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

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

$\cos x = u$

$\cos^2 x = u^2$

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

Integral inmediata

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

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

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