

6.5) Calcúlese los siguientes integrales:

$$a) \int_0^1 \frac{x^2}{\sqrt[4]{x^3+1}} dx = \frac{1}{3} \int_0^1 3x^2 \cdot (x^3+1)^{-1/4} dx = \frac{1}{3} \left[\frac{(x^3+1)^{3/4}}{3/4} \right]_0^1 =$$

$$= \frac{4}{9} \left[(x^3+1)^{3/4} \right]_0^1 = \frac{4}{9} (\sqrt[4]{2^3} - 1) = \frac{4}{9} (\sqrt[4]{8} - 1)$$

$$b) \int_0^{\pi/4} \sqrt{\cos x} \cdot \sin x \cdot dx = - \int_0^{\pi/4} -(\cos x)^{1/2} \cdot \sin x \cdot dx = - \left[\frac{(\cos x)^{3/2}}{3/2} \right]_0^{\pi/4} =$$

$$= -\frac{2}{3} \left(\left(\cos \frac{\pi}{4} \right)^{3/2} - \cos(0)^{3/2} \right) = -\frac{2}{3} \left(\left(\frac{1}{\sqrt{2}} \right)^{3/2} - 1 \right) =$$

$$= \frac{2}{3} \left(1 - \frac{1}{\sqrt[4]{8}} \right)$$