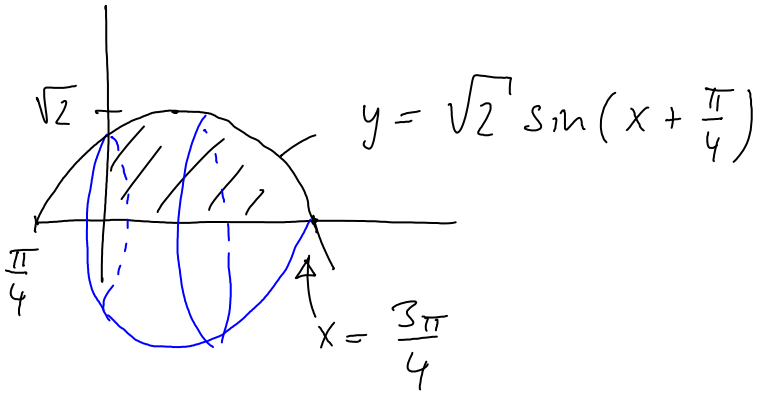
2419

den 13 februari 2010
22:57

MaD-kunskaper

Skiss av område: $\sin x + \cos x = \sqrt{2}\sin\left(x+\frac{\pi}{4}\right)$



$$V = \pi \cdot \int_0^{3\pi/4} \left(\sqrt{2}\sin\left(x+\frac{\pi}{4}\right)\right)^2 dx = \pi \int_0^{3\pi/4} 2\sin^2\left(x+\frac{\pi}{4}\right) dx =$$

$$= 2\pi \int_0^{3\pi/4} \frac{1-\cos 2(x+\pi/4)}{2}\, dx =$$

$$= 2\pi \left[\frac{x}{2} - \frac{\sin 2(x+\pi/4)}{4}\right]_0^{3\pi/4} =$$

$$= \pi\left(\frac{3\pi}{4} - \frac{\sin 2\pi}{2} + \frac{\sin \pi/2}{2}\right) =$$

$$= \pi\left(\frac{3\pi}{4} + \frac{1}{2}\right) = \frac{3\pi^2}{4} + \frac{\pi}{2}$$