

Delvis integrasjon:

$$\begin{aligned}\int_0^{\pi} x \sin^2 x dx &= x \left[\frac{1}{2}(x - \sin x \cos x) \right]_0^{\pi} - \frac{1}{2} \int_0^{\pi} x dx + \int_0^{\pi} \sin x \cos x dx \\ &= \frac{\pi^2}{2} - \frac{1}{2} \left[\frac{1}{2} x^2 \right]_0^{\pi} + \left[-\frac{1}{2} \cos^2 x \right]_0^{\pi} \\ &= \frac{\pi^2}{2} - \frac{\pi^2}{4} - \frac{1}{2} + \frac{1}{2} \\ &= \frac{\pi^2}{4}\end{aligned}$$