Skjæringspunkter: $\sin x = \cos x \iff x = \frac{\pi}{4} + k\pi, \ k \in \mathbb{Z}$.

Fra figuren er "våre" skjæringspunkter $x = \frac{\pi}{4}$ og

$$x = \frac{\pi}{4} - \pi = -\frac{3\pi}{4}.$$

$$A = \int_{-\frac{3\pi}{4}}^{\frac{\pi}{4}} \cos x \, dx - \int_{-\frac{3\pi}{4}}^{\frac{\pi}{4}} \sin x \, dx$$

$$= \left[\sin x \right]_{x=-\frac{3\pi}{4}}^{\frac{\pi}{4}} + \left[\cos x \right]_{x=-\frac{3\pi}{4}}^{\frac{\pi}{4}}$$

$$= \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} = \frac{4\sqrt{2}}{2} = \underline{\underline{2\sqrt{2}}}$$

9.1:

5) $$\int \frac{\ln(x^2)}{x^2} dx \underset{\downarrow}{=} -\frac{\ln(x^2)}{x} - \int \frac{2}{x}\left(-\frac{1}{x}\right) dx$$

$u = \ln(x^2)$

$v' = \frac{1}{x^2} = x^{-2}$

$\Downarrow$

$u' = \frac{1}{x^{\cancel{2}}} 2\cancel{x} = \frac{2}{x}$

$v = -x^{-1} = -\frac{1}{x}$

$$= -\frac{\ln(x^2)}{x} + 2\int x^{-2} dx$$

$$= -\frac{\ln(x^2)}{x} + 2\left(-x^{-1}\right) + C$$

$$= -\frac{\ln(x^2)}{x} - \frac{2}{x} + C$$

$$= -\frac{2}{x}\left(\underline{\underline{\ln(x) + 1}}\right) + C$$

$\downarrow$

$$\boxed{\ln(x^2) = \ln(x) + \ln(x) = 2\ln(x)}$$