144ページ	章末問題7.6(2)	解答	1/2

$$\frac{x-\mu}{\sqrt{2}\sigma} = t \text{ とおくと}$$

$$\int_{-\infty}^{\infty} x f(x)\, dx$$

$$= \int_{-\infty}^{\infty} (\sqrt{2}\sigma t + \mu) \cdot \frac{1}{\sqrt{2\pi}\sigma} e^{-t^2} \cdot \sqrt{2}\sigma\, dt$$

$$= \frac{1}{\sqrt{\pi}} \int_{-\infty}^{\infty} (\sqrt{2}\sigma t + \mu) e^{-t^2}\, dt$$

$$= \frac{1}{\sqrt{\pi}} \left(\sqrt{2}\sigma \int_{-\infty}^{\infty} t e^{-t^2}\, dt + \mu \int_{-\infty}^{\infty} e^{-t^2}\, dt \right)$$

$$= \frac{1}{\sqrt{\pi}} \left(0 + 2\mu \int_{0}^{\infty} e^{-t^2}\, dt \right) = \frac{2\mu}{\sqrt{\pi}} \cdot \frac{\sqrt{\pi}}{2} = \mu$$