Noise

Q3). $I(x,y) + G(x,y) = K(x,y)$

Independent is also given

$$\boxed{p_K(k) = \int_{-\infty}^{\infty} p_I(i)\, p_G(k-i)\, di}$$

From previous ~~exp~~ exercise.

$$\boxed{f_x(x) = \frac{1}{\sqrt{2\pi}\,\sigma} e^{-x^2/2\sigma^2}}$$ {Gaussian Distribution}

For $\mu = 0$ $\sigma = \sigma$

So $$\boxed{p_G(k-i) = \frac{1}{\sqrt{2\pi}\,\sigma} e^{\frac{-(k-i)^2}{2\sigma^2}}}$$

$$p_K(k) = \int_{-\infty}^{\infty} p_I(i) \frac{1}{\sqrt{2\pi}\,\sigma} e^{\frac{-(k-i)^2}{2\sigma^2}}\, di$$

$$= \frac{1}{\sqrt{2\pi}\,\sigma} \int_{-\infty}^{\infty} p_I(i)\, e^{\frac{-(k-i)^2}{2\sigma^2}}\, di$$