1.35 $$\int_{-\infty}^{\infty} x p(x)\,dx = \mu \qquad (1.106)$$

$$\int_{-\infty}^{\infty} (x-\mu)^2 p(x)\,dx = \sigma^2 \qquad (1.107)$$

$$H[x] = -\int p(x) \ln p(x)\,dx$$

$$= -\int p(x) \left(-\frac{1}{2}\ln(2\pi\sigma^2) - \frac{(x-\mu)^2}{2\sigma^2}\right) dx$$

$$= \frac{1}{2}\left(\ln(2\pi\sigma^2) + \frac{1}{\sigma^2}\int p(x)(x-\mu)^2\,dx\right)$$

$$= \frac{1}{2}\left(\ln(2\pi\sigma^2) + 1\right)$$