

**Example 10.12** Let  $X$  be uniformly distributed on  $[0, a)$ . Then

$$h(X) = - \int_0^a \frac{1}{a} \log \frac{1}{a} dx = \log a.$$

**Remark**  $h(X) < 0$  if  $a < 1$ , so  $h(\cdot)$  cannot be a measure of information.

**Example 10.13 (Gaussian Distribution)** Let  $X \sim \mathcal{N}(0, \sigma^2)$ . Then

$$h(X) = \frac{1}{2} \log(2\pi e\sigma^2).$$