

## Theorem 10.14 (Translation)

$$h(X + c) = h(X).$$

## Theorem 10.15 (Scaling) For $a \neq 0$ ,

$$h(aX) = h(X) + \log |a|.$$

**Remarks on Scaling** The differential entropy is

- increased by  $\log |a|$  if  $|a| > 1$
- decreased by  $-\log |a|$  if  $|a| < 1$
- unchanged if  $a = -1$
- related to the “spread” of the pdf