

- Convention

$$Eg(X) = \sum_x p(x)g(x)$$

where summation is over  $\mathcal{S}_X$ .

- Linearity

$$E[f(X) + g(X)] = Ef(X) + Eg(X)$$

See Problem 5 for details.

- Can write

$$H(X) = -E \log p(X) = - \sum_x p(x) \log p(x)$$

- In probability theory, when  $Eg(X)$  is considered, usually  $g(x)$  depends only on the value of  $x$  but not on  $p(x)$ .