

1. Let X be a random variable with probability mass function

$$p(j) = \begin{cases} \frac{2}{9} & \text{if } j = -1 \\ \frac{1}{9} & \text{if } j = 0 \\ \frac{2}{9} & \text{if } j = 3 \\ \frac{4}{9} & \text{if } j = 7 \\ 0 & \text{else} \end{cases}$$

Compute $\mathbb{E}[\min\{X, 1\}]$.

ANSWERS

1.

$$\begin{aligned}\mathbb{E}[\min\{X, 1\}] &= \sum_j \min\{j, 1\}p(j) \\ &= \min\{-1, 1\}\frac{2}{9} + \min\{0, 1\}\frac{1}{9} + \min\{3, 1\}\frac{2}{9} + \min\{7, 1\}\frac{4}{9} \\ &= (-1)\frac{2}{9} + (0)\frac{1}{9} + (1)\frac{2}{9} + (1)\frac{4}{9} = \frac{-2 + 0 + 2 + 4}{9} = \frac{4}{9}.\end{aligned}$$