Exercise 3.10. Let X have probability mass function

$$P(X = -1) = \tfrac{1}{2},\ P(X = 0) = \tfrac{1}{3},\ \text{and}\ P(X = 1) = \tfrac{1}{6}.$$

Calculate $E[|X|]$ using the approaches in (a) and (b) below.

(a) First find the probability mass function of the random variable $Y = |X|$ and using that compute $E[|X|]$.
(b) Apply formula (3.24) with $g(x) = |x|$.

Exercise 3.12. Suppose that X is a random variable taking values in $\{1, 2, 3, \dots\}$ with probability mass function

$$p_X(n) = \frac{6}{\pi^2} \cdot \frac{1}{n^2}.$$

Show that $E[X] = \infty$.

Hint. See Example D.5.