MTH 451 Quiz 4

Evan Fox (efox20@uri.edu)

February 9, 2022

Question 1.

(a) Applying the definition gives

$$\mathrm{E}(X) = \sum_{x \in X} x f(X) = 0 * 7/17 + 1 * 5/17 + 2 * 3/17 + 3 * 2/17 = 1$$

(b) Since E is linear $\mathrm{E}(2x + 3) = 2\,\mathrm{E}(X) + 3 = 2 + 3 = 5$

(c) We use the LOTUS.

$$\mathrm{E}(X^2) = \sum_{x \in X} x^2 f(X)$$

$$= 0^2 * 7/17 + 1^2 * 5/17 + 2^2 * 3/17 + 3^2 * 2/17 = 35/17$$

(d) By definiton $V(X) = E[x - E[X]^2]$, Then we have $V(X) = E(X^2) - E(X)^2 = 35/17 - 1 = 18/17$

(e) Since $V(aX + b) = a^2 V(X)$ we have

$$V(2X + 3) = 4V(X) = 4(18/17) = 72/12$$