

Quiz 2 Solution

1.

$$\begin{aligned} E[X] &= \int x f_X(x) dx = \int_{-1}^0 0.2x dx + \int_0^1 (0.2x + 1.2x^2) dx \\ &= 0.1x^2 \Big|_{-1}^0 + 0.1x^2 \Big|_0^1 + 0.4x^3 \Big|_0^1 = 0 - 0.1 + 0.1 - 0 + 0.4 - 0 \\ &= 0.4 \end{aligned}$$

2. Let X be the lifetime of a radio. We need to compute

$$P(X > 4 + 2|X > 4) = P(X > 6|X > 4)$$

If $X \sim \text{Uniform}(0, 16)$, then

$$P(X > 6|X > 4) = \frac{P(\{X > 6\} \cap \{X > 4\})}{P(X > 4)} = \frac{P(X > 6)}{P(X > 4)} = \frac{10/16}{12/16} = \frac{5}{6}$$