1. Suppose that the random variable X is equal to the number of hits obtained by a certain baseball player in his next 3 at bats. If $P(X = 1) = 0.3, P(X = 2) = 0.2$, and $P(X = 0) = P(X = 3)$,

   i) find $E(X)$,

       A) 2.20   B) 0.70   C) 1.45   D) 1.60

   ii) find $\text{Var}(X)$.

       A) 1.9   B) 1.2475   C) 3.35   D) 2.1025

2. If $E(X) = 1$ and $\text{Var}(X) = 5$,

   i) find $E[(2 + X)^2]$

       A) 9   B) 5   C) 10   D) 14

   ii) find $\text{Var}(4 + 3X)$

       A) 19   B) 15   C) 49   D) 45

3. Suppose that X takes on one of the values $0, 1, 2$. If for some constant c, that $P(X = i) = cP(X = i-1), i = 1, 2$. Find $E(X)$.

       A) $\dfrac{c + 2c^2}{c^2 + c + 1}$ B) $\dfrac{c}{c^2 + c + 1}$ C) $\dfrac{1}{c^2 + c + 1}$ D) $\dfrac{c^2}{c^2 + c + 1}$

4. Suppose that $P(X = 0) = 1 - P(X = 1)$ and $P(X = 1) \neq 0$. If $E(X) = 3\text{Var}(X)$, find $P(X = 0)$.

       A) 0   B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{1}{2}$

5. If X is a binomial random variable with expected value 6 and variance 2.4, find $P(X = 5)$.

       A) 0.2   B) 0.7   C) 0.5   D) 0.6

6. If X has a density function given by

$$f(x) = \begin{cases} \frac{1}{4}xe^{-x/2}, & x > 0 \\ 0, & \text{otherwise} \end{cases}$$

   i) compute $E(X)$

       A) 1   B) 8   C) 4   D) 16

   ii) compute $\text{Var}(X)$

       A) 16   B) 4   C) 24   D) 8

7. The density function of X is given by

$$f(x) = \begin{cases} 1 & \text{if } 0 \le x \le 1 \\ 0 & \text{otherwise} \end{cases}$$

   Find $E(e^X)$.

A) e B) $e - 1$ C) $1 + e$ D) $2e$