

STAT/MA 41600
In-Class Problem Set #11: September 18, 2015
Solutions by Mark Daniel Ward

Problem Set 11 Answers

1. Each X_i has $\mathbb{E}(X_i) = 0.6$, so $\mathbb{E}(X) = \mathbb{E}(X_1 + X_2 + X_3) = \mathbb{E}(X_1) + \mathbb{E}(X_2) + \mathbb{E}(X_3) = 0.6 + 0.6 + 0.6 = 1.8$.

2a. Each Y_i has $\mathbb{E}(Y_i) = 1/4$, so $\mathbb{E}(Y) = \mathbb{E}(Y_1 + Y_2) = \mathbb{E}(Y_1) + \mathbb{E}(Y_2) = 1/4 + 1/4 = 1/2$.

2b. Each Z_i has $\mathbb{E}(Z_i) = 1/4$, so $\mathbb{E}(Y) = \mathbb{E}(Z_1 + Z_2) = \mathbb{E}(Z_1) + \mathbb{E}(Z_2) = 1/4 + 1/4 = 1/2$.

3. We have $\mathbb{E}(X_1) = 1/3$ and $\mathbb{E}(X_2) = 1/2$, so $\mathbb{E}(X) = \mathbb{E}(X_1 + X_2) = \mathbb{E}(X_1) + \mathbb{E}(X_2) = 1/3 + 1/2 = 5/6$.

4a. We have $\mathbb{E}(X_i) = 1/3$ for each i , so $\mathbb{E}(X) = \mathbb{E}(X_1 + \cdots + X_5) = \mathbb{E}(X_1) + \cdots + \mathbb{E}(X_5) = 1/3 + 1/3 + 1/3 + 1/3 + 1/3 = 5/3$.

4b. We have $\mathbb{E}(Y_i) = 5/9$ for each i , so $\mathbb{E}(X) = \mathbb{E}(Y_1 + Y_2 + Y_3) = \mathbb{E}(Y_1) + \mathbb{E}(Y_2) + \mathbb{E}(Y_3) = 5/9 + 5/9 + 5/9 = 5/3$.