

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  $\mathbb{E}(X) = \mathbb{E}(Y_1 + Y_2 + Y_3) = \mathbb{E}(Y_1) + \mathbb{E}(Y_2) + \mathbb{E}(Y_3) = 5/9 + 5/9 + 5/9 = 5/3$ .