

Math 107. Homework #5. Solutions.

6.62. (a) $\mu = 0 \cdot 0.5 + 1 \cdot 0.25 + 2 \cdot 0.15 + 3 \cdot 0.1 = 0.85$;
(b) $\sigma^2 = (0 - 0.85)^2 \cdot 0.50 + (1 - 0.85)^2 \cdot 0.25$
 $+ (2 - 0.85)^2 \cdot 0.15 + (3 - 0.85)^2 \cdot 0.1 \sim 1.03$.

6.72. $\mu = np = 15 \cdot 0.95 = 14.25$;
 $\sigma = \sqrt{np(1-p)} = \sqrt{15 \cdot 0.95 \cdot 0.05} \sim 0.84$.

6.76. The mean μ computed from the table is equal to 0.799. It is very close to $\lambda = 0.8$. There are two reasons why it differs from λ which is the mean of the Poisson distribution. Firstly, in the table the values of the probabilities are given only up to three decimal places; secondly, the table does not list the probabilities of all the values of the random variable (although the probabilities of other values are small, their sum might contribute to the missing 0.001).

6.80. The probability is at least $1 - 1/3^2 \sim .8888$.

7.8. (a) 0.2823;
(b) $0.5000 + 0.4938 = 0.9938$;
(c) $0.5000 - 0.4938 = 0.0606$;
(d) $0.2454 - 0.1293 = 0.1161$.

7.10. (a) $0.1480 + 0.1480 = 0.2960$;
(b) $0.4980 + 0.4987 = 0.9967$;
(c) $0.4756 - 0.4750 = 0.0006$;
(d) $0.4938 + 0.4772 = 0.9710$.