Section 10/12

1 Question 6.6

Ages in a population have a mean of 40 years. Let X be the age of a person picked at random from the population.

a) If possible, find $P(X \geq 80)$. If it's not possible, explain why, and find the best upper bound you can based on the information given.

b) Suppose you are told in addition that the SD of the ages is 15 years. What can you say about $P(10 < X < 70)$?

c) With the information in Part b, what can you say about $P(10 \leq X \leq 70)$?

2 Question 7.6

Let X have the Poisson (μ) distribution. Let Y have the Poisson (λ) distribution and suppose X and Y are independent.

a) Use properties of expectation and variance to find $E(X+Y)$ and $SD(X+Y)$.

b) What is the distribution of $X + Y$? Check that your answer is consistent with your answer to Part a.

3   Question 7.9

In a country, State A has 40 million people and State B has 10 million people. The two states have the same proportion of college graduates.

In each of part below, pick one of the three options without calculation and explain your choice.

a) In each state, a simple random sample of 500 people is taken. The SD of the number of college graduates in the sample from State A is

- quite a bit less than

- about the same as

- quite a bit more than

the SD of the number of college graduates in the sample from State B.

b) In each state, a simple random sample of 0.01% of the population is taken. The SD of the number of college graduates in the sample from State A is

- quite a bit less than

- about the same as

- quite a bit more than

the SD of the number of college graduates in the sample from State B.