1. Too much cholesterol in the blood increases the risk of heart disease. Young women are generally less afflicted with high cholesterol than other groups. The cholesterol level for women aged 20 to 34 follow an approximately normal distribution with mean $185 \text{ mg/dL}$, $\mu$, and a standard deviation, $39 \text{ mg/dL}$. The random variable $X$ measures the cholesterol level of a woman in the mentioned age group. Cholesterol levels above $240 \text{ mg/dL}$ demand medical attention. Cholesterol level measurements are independent of each other.

a. [4] What is the probability that a woman aged 20 to 34 chosen at random requires medical attention due to high cholesterol levels?

b. [4] Suppose four women aged 20 to 34 are chosen at random what is the probability that all four would require medical attention due to high cholesterol levels?

c. [4] Suppose four women aged 20 to 34 are chosen at random, what is the probability that the average of the four cholesterol levels exceeds $240 \text{ mg/dL}$? Show work for this problem on the back of this sheet.