1. Suppose that the weight of a randomly chosen beagle is Normally distributed with mean 17.2 pounds and standard deviation 1.8 pounds. Let $X$ denote the weight of such a randomly chosen beagle (in pounds).
   1a. Find $P(17 < X < 18)$.
   1b. Find $P(|X - 17.2| > 1)$.
   1c. Find $P\left(\frac{X - 17.2}{1.8} < 2\right)$.

2. Same setup as question #1.
   2a. Find $P(X > 19 \mid X > 18)$.
   2b. Find $P(X < 19 \mid X < 20)$.
   2c. Find a value $c$ such that $P(17.2 - c < X < 17.2 + c) = 0.40$.

3. Same setup as question #1. Suppose that 10 beagles are weighed (and their weights are independent). Consider the weight of a beagle to be "heavy" if it weighs more than 19 pounds. Let $Y$ denote the number of beagles that are "heavy," among these 10 beagles.
   3a. What kind of random variable is $Y$? What is/are the parameter(s) of $Y$?
   3b. Find $P(Y \geq 3)$.

4. Suppose that $X$ is a Normal random variable with $\mathbb{E}(X) = 5$ and $\text{Var}(X) = 2$.
   4a. What is the probability that $X$ is positive?
   4b. Let $Y = \frac{1}{3}X - 2$. What is the probability that $Y$ is positive?