Homework 7: The pdf and cdf

1. §3.2, #4, 8

2. §3.3, #2

3. The probability density function of X, the lifetime of a certain electronic device (measured in hours), is given by

$$f_X(x) = \begin{cases} \frac{10}{x^2}, & x > 10 \\ 0, & x \leq 10 \end{cases}$$

   (a) Find $P(X > 20)$.

   (b) Find and sketch $F_X(x)$.

   (c) What is the probability that of 6 such devices at least 3 will function for at least 15 hours? What assumptions are you making?

4. A continuous random variable X has cdf given by

$$F_X(x) = \begin{cases} 0, & x \leq 0 \\ \frac{1}{9}x^2, & 0 < x \leq 3 \\ 1, & x > 3 \end{cases}$$

   (a) Find and sketch $f_X(x)$.

   (b) Find $P(1 < X \leq 2)$ by using the cdf.