## CS 333202: Probability and Statistics HW7 Part I

1. Let X denote the lifetime of a radio, in years, manufactured by a certain company. The density function of X is given by

$$f(x) = \begin{cases} \frac{1}{15}e^{-x/15} & \text{if } 0 \le x < \infty\\ 0 & \text{otherwise} \end{cases}$$

What is the probability that, of eight such radios, at least four last more than 15 years?

2. The amount of time, in hours, that a computer functions before breaking down is a continuous random variable with probability density function given by

$$f(x) = \begin{cases} \lambda e^{-x/100} & x \ge 0\\ 0 & x < 0 \end{cases}$$

What is the probability that

- (a) a computer will function between 50 and 150 hours before breaking down;
- (b) it will function less than 100 hours?
- 3. If X is continuous with distribution function  $F_X$  and density function  $f_X$ , find the density function of Y = 2X.