## 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

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

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

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

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 $Y=2 X$.

