1. A continuous random variable $X$ has probability density function $p(x) = \frac{1}{9}$, $0 \leq x \leq 9$. Find $b$ so that

$$\text{Prob}(0 \leq X \leq b) = \frac{1}{3}.$$ 

2. Let $f(x) = k\sqrt{x}$, where $k$ is a constant. Find the value of $k$ so that $f(x)$ is a probability density function on $0 \leq x \leq 4$. 
3. Compute the cumulative distribution function corresponding to the probability density function \( f(x) = 2(x - 1) \), for \( 1 \leq x \leq 2 \).

4. Let \( X \) be the continuous random variable corresponding to the failure time (from purchase time) of a certain brand of cell phone. Let the probability density function of \( X \) be

\[
p(x) = e^{-x}, \quad \text{for } x \geq 0
\]

Determine the average failure time for that brand of cell phones.
1. A continuous random variable $X$ has probability density function $p(x) = \frac{1}{6}, \ 0 \leq x \leq 6$. Find $b$ so that

$$\text{Prob}(0 \leq X \leq b) = \frac{1}{3}.$$
3. Compute the cumulative distribution function corresponding to the probability density function $f(x) = \frac{1}{2}(x - 1)$, for $1 \leq x \leq 3$.

4. Let $X$ be the continuous random variable corresponding to the failure time (from purchase time) of a certain brand of cell phone. Let the probability density function of $X$ be

$$p(x) = e^{-x}, \quad \text{for } x \geq 0$$

Determine the average failure time for that brand of cell phones.