

Worksheet 10

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1. Find $\Pr(1 \leq X \leq 2)$ when X is the random variable whose density function is $f(x) = x/18$, $0 \leq x \leq 6$.
2. Find $\Pr(X \leq 3)$ when X is the random variable whose density function is $f(x) = 1/4$, $1 \leq x \leq 5$.
3. The cumulative distribution function for a random variable on the interval $1 \leq x \leq 2$ is $F(x) = \frac{4}{3} - \frac{4}{3x^2}$. Find the corresponding density function.
4. Compute the cumulative distribution function corresponding to the density function $f(x) = 1/5$, $2 \leq x \leq 7$.
5. Find the expected value and the variance of the random variable X whose probability density function is given by $f(x) = \frac{3}{2} \cdot x - \frac{3}{4} \cdot x^2$, $0 \leq x \leq 2$.
6. The time (in minutes) required to complete an assembly on a production line is a random variable X with the cumulative distribution function $F(x) = \frac{1}{125} \cdot x^3$, $0 \leq x \leq 5$.
 - (a) Find $E(X)$ and give an interpretation of this quantity.
 - (b) Compute $\text{Var}(X)$.
7. Let X be a continuous random variable with values between $A = 1$ and $B = \infty$, and with the density function $f(x) = 4x^{-5}$. Compute $E(X)$ and $\text{Var}(X)$.