

Median and Mean

Example

1. Let $g(x) = \begin{cases} x & 0 \leq x \leq 1 \\ 2 - x & 1 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.

Problems

2. True False It is possible for the mean for a discrete PDF to not exist.
3. True False Another name for the mean of a PDF is the expected value.
4. True False For a discrete PDF, we can always choose the mean with nonzero probability.
5. True False For a discrete PDF, we can always choose the median with nonzero probability.
6. True False There exists a uniform distribution on all the real numbers.
7. Let $g(x) = \begin{cases} x^2 & -1 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.
8. Let $g(x) = \begin{cases} xe^{-x^2} & 0 \leq x \\ 0 & \text{otherwise} \end{cases}$. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.
9. Let $g(x) = \begin{cases} e^{-x} & -1 \leq x \\ 0 & \text{otherwise} \end{cases}$. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.
10. Let $g(x) = \begin{cases} \frac{1}{x^4} & x \leq -1 \\ 0 & \text{otherwise} \end{cases}$. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.

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11. Let $g(x) = \frac{1}{1+x^2}$ for $x \geq 0$ and 0 otherwise. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.
12. Let $g(x) = \begin{cases} \frac{1}{x^4} & 2 \leq x \\ 0 & \text{otherwise} \end{cases}$. Find c such that $f(x) = cg(x)$ is a PDF. Graph f and the CDF F . Find the mean and median of $f(x)$.