POLL
Which of the following is true about a continuous random variable on R?

RESULTS

Its pdf must integrate to 1 on R	**68%**
Its cdf must integrate to 1 on R	**25%**
None of the above	**7%**

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Results gathered from 164 respondents.

FEEDBACK
Its pdf must integrate to 1 on R.

1

0/1 point (graded)
F is the cumulative distribution function for a continuous random variable. If $F(b) - F(a) = 0.20$, then

- $[a, b]$ has length 0.20
- $P(X = b) - P(X = a) = 20\%$ ✖
- $P(X \in (a, b]) = 20\%$ ✔

Answer
Incorrect: Video: Continuous Distributions

Explanation
Recall that $F(b) = P(X \leq b)$, $F(a) = P(X \leq a)$. Hence $P(a < X \leq b) = F(b) - F(a) = 0.2$

Submit You have used 2 of 2 attempts

Answers are displayed within the problem

2

2.0/2.0 points (graded)

Which of the following holds for all continuous probability distribution function $f(x)$ having support set $\mathbb{R}$?

- [x] $\forall x \in \mathbb{R}, \quad f(x) \geq 0$ ✔
- [ ] $\forall x \in \mathbb{R}, \quad f(x) \leq 1$
- [x] $\exists x \in \mathbb{R}, \quad f(x) \leq 1$ ✔
- [x] If the limits of $f(x)$ at positive and negative infinity exist, then $\lim_{x\to\infty} f(x) = \lim_{x\to-\infty} f(x) = 0$ ✔

✔

Explanation

1. By definition, $f(x) \geq 0$.
2. Consider Gaussian $\mathcal{N}(0, 1/(8\pi))$. For this probability density function, $f(0) = 2 > 1$.
3. If $f > 1, \forall x \in \mathbb{R}, \int_{\mathbb{R}} f(z)\,dz = \infty$, but we require $\int_{\mathbb{R}} f(z)\,dz = 1$.
4. Suppose $\exists \epsilon,\ x_0 > 0$ such that $\forall x \geq x_0,\ f(x) > \epsilon$, then $\int_{\mathbb{R}} f(z)\,dz = \infty$. Thus there cannot exist such an $\epsilon,\ x_0 > 0$ and hence $\lim_{x\to\infty} f(x) = 0$. Similarly $\lim_{x\to-\infty} f(x) = 0$.

Submit You have used 1 of 3 attempts

Answers are displayed within the problem

Discussion

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Staff