

Continuous distributions

1. Which of the following can be the c.d.f. of a continuous distribution?

$$(a) F(x) = \begin{cases} 1 + e^{1-x} & , \text{ if } x > -1, \\ 0 & , \text{ otherwise} \end{cases}$$

$$(b) F(x) = \begin{cases} 2 - \frac{2}{x+1} & , \text{ if } x \geq 0, \\ 0 & , \text{ otherwise} \end{cases}$$

$$(c) F(x) = \begin{cases} 1 - e^{-x} & , \text{ if } x \geq 0, \\ 0 & , \text{ otherwise} \end{cases}$$

$$(d) F(x) = \begin{cases} 0 & , \text{ ha } x \leq 0, \\ \frac{x}{4} \cdot (4 - x) & , \text{ ha } 0 < x \leq 2, \\ 1 & , \text{ ha } x > 2 \end{cases}$$

2. Which of the following can be the p.d.f. of a continuous distribution?

$$(a) f(x) = \begin{cases} \frac{2}{x} & , \text{ if } x > 1, \\ 0 & , \text{ ow} \end{cases}$$

$$(b) f(x) = \begin{cases} \frac{\sin(x)}{2} & , \text{ if } 0 < x < 2, \\ 0 & , \text{ ow} \end{cases}$$

$$(c) f(x) = \begin{cases} 3^{x-1} \ln(3) & , \text{ ha } x \leq 0, \\ \frac{1}{3} \sin\left(\frac{x}{2}\right) & , \text{ if } 0 < x < \pi, \\ 0 & , \text{ ow} \end{cases}$$

$$(d) f(x) = \begin{cases} 2e^{-2x} & , \text{ if } x > 0, \\ 0 & , \text{ ow} \end{cases}$$

3. Find the median, expectation and variance of the r.v. with p.d.f.

$$f(x) = \begin{cases} 2x & , \text{ if } 0 < x < 1, \\ 0 & , \text{ ow} \end{cases}$$

4. The lifetime of a TV (in years) is exponential with parameter $\lambda = 1/8$. If someone buys a used one, what is the probability that he can use it for more than 8 years?