

Continuous Random Variable Practice:

Complete this after Activity #9.

Situation: The probability that a battery will hold a charge for X years is modeled by $f(x) = \frac{2}{(x+1)^3}$.

1. Show that this is, in fact, a valid probability function.
2. Find the probability that a randomly selected battery lasts between 2 and 5 years.
3. Find the probability that a randomly selected battery lasts more than 5 years.
4. Find the probability that a randomly selected battery lasts *5 years or more*.
5. Find the probability that a randomly selected battery lasts exactly 5 years.
6. Write out the cumulative distribution function (cdf) and use it to calculate the probability of a battery lasting between 2 and 5 years.
7. Find the median (50th percentile) number of years a battery lasts.
8. Find the 90th percentile of the number of years a battery lasts.