

Answer on Question #54347-Math-Statistics and Probability

Suppose that the life of a certain type of electron tube has an exponential distribution with a mean life of 500 hours. Find the probability that it will last for another 600 hours if the tube has been in operation for 300 hours.

Solution

The probability that it will last for another 600 hours if the tube has been in operation for 300 hours is

$$P(T > 600 + 300 | T > 300).$$

An exponential distribution has such property as memorylessness. So,

$$P(T > 600 + 300 | T > 300) = P(T > 600).$$

Thus,

$$P(T > 600) = e^{-\frac{600}{500}} = e^{-1.2} \approx 0.3012.$$

Answer: $e^{-1.2} \approx 0.3012$.