**Answer on Question #51467 – Math – Statistics and Probability**

If a random variable X has a cumulative distribution function F(x) given by

0 , x≤0

F(x) = c (x-e^(-x)) , 0<x<1

1 , x≥1

then find its corresponding probability distribution function and hence calculate

P(0<x<1)

**Solution.**

**There was a mistake in assignment, because $F(x)$ is related to probability, but probability is not greater than 1.**

**A cumulative distribution function of X is given by**

$$F(x) = \begin{cases} 0, & x \le 0 \\ c(x - e^{-x}), & 0 < x < 1 \\ 1, & x \ge 1 \end{cases}$$

$$\textit{Probability distribution function } p(x) = \frac{dF}{dx} = \begin{cases} 0, & x \le 0 \\ c(1 + e^{-x}), & 0 < x < 1 \\ 0, & x \ge 1 \end{cases}$$

$$P(0 < X < 1) = P(X < 1) - P(X \le 0) = F(1) - \lim_{x \to 0+} F(x) = 1 - c.$$