computing probabilities with cdf

exercise 3

Random variable T is distributed with the following probability density function:

$$f(t) = \begin{cases} ct(t-1) & \text{for } 0 \leq t \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

(a) Calculate the value of c.

(b) Calculate the cumulative distribution function $F(t)$.

(c) Use the cdf $F(t)$ to calculate $P(1/3 \leq T \leq 2/3)$.

expected value of a continuous random variable