1. [11 points] Nancy is on an airplane traveling to see Carlos, and the flight is delayed. The function $f(t)$ is the probability density function (pdf) for how many hours, t, the flight will be delayed. The function $f(t)$ is given by

$$f(t) = \begin{cases} 0 & \text{if } t \leq 0, \\ -\frac{3}{4}(t-1)^2 + \frac{3}{4} & \text{if } 0 < t < 2, \\ 0 & \text{if } t \geq 2 \end{cases}$$

a. [6 points] Write a formula for the cumulative distribution function (cdf) $F(t)$ corresponding to the pdf $f(t)$. Your answer should not involve any integrals or the letter $f(t)$. Write your answer using the partially given piecewise notation below.

$$F(t) = \begin{cases} \\ \\ \\ \end{cases}$$

b. [2 points] What is the probability that Nancy's flight will be delayed less than 30 minutes?

c. [3 points] Carlos wants to find the mean amount of time the flight will be delayed, so he can arrive at the airport at the right time. Write an explicit expression involving integrals that gives the mean amount of time the flight will be delayed. Do not evaluate your expression. Your answer should not contain the letter f.