

1. [4 points] If you have not already done so, neatly write your 8-digit UMID number, your initials, your instructor's first and/or last name, and your section number in the spaces provided.

2. [9 points] The chain grocery store Mathmart stocks their shelves full of brain-targeted foods for their customers on a regular basis. The time (in minutes) it takes to stock the shelves after the delivery truck arrives is represented by the cumulative distribution function (cdf):

$$R(t) = \begin{cases} 0 & t < 1 \\ 1 - \frac{1}{t^3} & t \geq 1 \end{cases}$$

- a. [3 points] Find a formula for $r(t)$, a probability density function (pdf) corresponding to $R(t)$.

- b. [3 points] What is the median amount of time (in minutes) it takes to stock the shelves?

- c. [3 points] Write an integral representing the mean amount of time (in minutes) it takes to stock the shelves. Your expression should not contain r or R . Do not solve this integral.