Homework 7

Do the problems on **Webwork** and turn the following problems in class on Mar. 16th.

Homework should be written neatly and clearly explained. If it requires more than one sheet, the sheets must be stapled. Include your name and id number in the top right corner of your homework.

Problem 1. Let X be a random variable with probability density function

$$f_X(t) = Ce^{-4|t|}$$

for all real numbers t.

1) What is C?

2) What is $\mathbb{E}[X]$?

3) What is $\mathrm{Var}[X]$?

Problem 2. You are operating a train. Ticket for this train costs \$10. The train is late to the destination T minutes, where T is an exponential random variable with parameter $\beta = 4$. If the train is more than 2 minutes and less than 4 minutes late then each customer gets half of the ticket refunded. If the train is more than 4 and less than 8 minutes late each customer gets the full price of the ticket refunded. If the train is more than 8 minutes late each customer gets the full price of the ticket refunded and in addition gets $\$n$.

(a) For what values of n is the expectation of your profit positive?

(b) What is the probability you earn at least \$3 per ticket?