

## Continuous Probability Distributions Practice Problems

1. Weekly CPU time used by an accounting firm (measured in hours) has pdf given by

$$f(x) = \begin{cases} c x^2(4 - x), & 0 \leq x \leq 4 \\ 0, & \text{otherwise} \end{cases}$$

- Determine a value for  $c$  that makes this is a valid pdf.
- Find the probability that between 1 and 2 hours of CPU time is used in a given week.
- Find the expected value and variance of weekly CPU time.
- The CPU time costs the firm 200 dollars an hour. Find the expected value, variance, and standard deviation of the weekly cost for CPU time.

2. A rocket has a 2-hour window during which it can launch, with probability uniformly distributed through that launch window.
  - a. Find the probability that the launch occurs during the first 30 minutes of the window.
  - b. Find the probability that the launch occurs during the last 15 minutes of the window.
  - c. Find the probability that the launch occurs within 15 minutes of the center of the launch window.
  - d. Find the probability that the launch occurs between 60 and 90 minutes into the launch window, given that it didn't occur during the first 60 minutes.