Instructions: Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

- 1. Identify the type of distribution used in the problems below. Identify any parameters, but you do not need to perform the calculations.
 - a. A drive-thru at a particular bank sees 10 customers pass through during a particular hour of the day. Determine the probability that the check line will see 12 or more passengers in the next 10 minutes?
 - b. The length of a particular sample of snakes has a mean of 69 inches and a standard deviation of 5 inches. What is the probability that a snake in the colony will have a length of more than 75 inches?
 - c. A particular assembly line produces ball bearings between 1.4 and 1.5 cm in diameter 98% of the time and ball bearings outside that range 2% of time. A sample of 100 bearings is sent to quality control. What is the probability of having a sample with no ball bearings outside the required range?
- 2. Consider the probability distribution given by $\int_0^1 K(x^2 x^3) dx$.
 - a. Find the value of K that makes this a valid probability distribution.
 - b. Find the probability that $P(0.5 \le X \le 0.75)$.
 - c. Find the mean of the distribution.