MTH 324, Quiz #3, Fall 2022 Name _____

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 particular assembly line produces working computers 99% of the time and computers with malfunctions 1% of time. A sample of 10 computers is sent to quality control. What is the probability of having a sample with no malfunctions?

   b. A security check line at a particular airport sees 100 travelers pass through during a particular hour of the day. Determine the probability that the check line will see 30 or more passengers in the next 10 minutes?

   c. The weight of a particular colony of feral cats has a mean of 7.8 pounds and a standard deviation of 0.6 pounds. What is the probability that a cat in the colony will weigh more than 10 pounds?

2. Consider the probability distribution given by $\int_1^4 K(x^2 + x^3)dx$.
   a. Find the value of K that makes this a valid probability distribution.

   b. Find the probability that $P(2 \leq X \leq 3)$.

   c. Find the mean of the distribution.