Exam 2 — Extra Practice Problems

1. Suppose that a medical parts supplier produces parts with a mean length of 1 cm. Assume that the part lengths are normally distributed. How small should the standard deviation be to guarantee that at least 97% of the parts have a diameter between 0.98 and 1.02 cm?

2. When functioning normally, a machine produces delicious candies with the average weight (of a single candy) of 0.5 ounces. Whether functioning normally or not, the standard deviation in the weight of a single candy is 0.02. The candies are then packaged 40 to a box, for a theoretical net weight of 20 ounces.

   (a) What is the distribution of the TOTAL weight of candies in a box?

   (b) If the machine is functioning normally, what is the probability that the TOTAL weight in a box is less than 19.8 ounces?

   (c) Suppose that Samuel has messed with the calibration dials, and the mean weight of each candy is actually 0.497 ounces. Now what is the probability that the total weight of a box is less than 19.8 ounces?