Quiz 8.1A AP Statistics Name:

1. A consumer watchdog organization estimates the mean weight of 1-ounce "Fun-Size" candy bars to see if customers are getting full value for their money. A random sample of 25 bars is selected and weighed, and the organization reports that a 90% confidence interval for the true mean weight of the candy bars is 0.992 to 0.998 ounces.

(a) What is the point estimate from this sample?

(b) What is the margin of error?

(c) Interpret the 90% confidence *interval* 0.992 to 0.998 in the context of the problem.

(d) Interpret the confidence *level* of 90% in the context of the problem.

2. A manufacturer of flashlights wants to know how well one of their newer styles is selling in a chain of large home-improvement stores. They select a simple random sample of 20 stores, record how many of the flashlights were sold in a 30-day period, and construct a 95% confidence interval for the mean number of flashlights sold.

(a) Discuss whether this study meets the necessary conditions for constructing a confidence interval. If you think one of the conditions has not been met, what additional information would be required or what change in the study would you recommend?

(b) If, instead of constructing a 95% confidence interval, the flashlight manufacturer constructed a 98% confidence interval, would the 98% interval be wider, narrower, or the same width as the 95% interval? Explain.

(c) How would the width of confidence interval change if the flashlight manufacturer took a larger sample? Explain.

Quiz 8.1A

1. (a) Point estimate is the sample mean, which is the midpoint of the confidence interval: 0.995 ounces. (b) Margin of error is half the width of the interval: 0.003 ounces. (c) We are 90% confident that the interval from 0.992 to 0.998 ounces captures the true mean weight of Fun-Size candy bars. (d) If this method of constructing an interval were repeated many times, about 90% of the intervals constructed would contain the population mean weight of Fun-Size candy bars.

2. (a) Random: the problem states that an SRS was taken. Normal: we do not know if the number of flashlights sold in all stores is approximately Normally distributed. Since $n = 20$, we can't be confident that the central limit theorem applies. We either need information about the population distribution's shape, or we need to take a bigger sample. Independent: we are sampling stores without replacement, so to be confident that observations are independent, we need to know that there are more than 10 x 20 = 200 stores in the population. It seems reasonable to assume that flashlight sales in individual stores are independent. (b) If our interval has to capture the true mean 98% of the time in repeated samples instead of only 95% of the time, it will have to be wider. (c) If the sample size is larger, the standard deviation of the sampling distribution will be smaller, so the confidence interval will be narrower.