Bottles of liquid soap are normally distributed in weight with a mean of 64 ounces and a standard deviation 0.5 ounces.

(a) Let various random samples of size 21 be collected. Compute $P(0.47 \leq S \leq 0.55)$.

(b) Suppose $\sigma$ is unknown, but a random sampling of 26 bottles yields $S = 0.60$. Find a 95% confidence interval for the true standard deviation.

(c) Using $S = 0.60$ from a sample of 26 bottles, is there evidence, at the 10% level of significance, to reject the claim that $\sigma = 0.5$? State null and alternative hypotheses, give the test-statistic and $P$-value, and use the $P$-value to explain your conclusion in detail.