1. The quality of cotton cloth is a function of the quality of the raw cotton used in its manufacture. One key attribute of raw cotton is the length of the cotton fibers: the longer the better. Suppose a yarn mill buys raw cotton from a cotton gin that produces cotton fiber with a mean length of 1.25 inches and a standard deviation of 0.25 inches.
2. The quality of the cloth the manufacture tries to achieve requires 99% of the cotton fibers in the raw material have a length of a least one inch. Assuming that the length of cotton fibers is normally distributed, how close are they to that goal now?
3. The manufacture is considering changing suppliers. In response the cotton gin the buy from is trying to change its procedures to make the cotton fiber it provides more uniform. Assuming the new process gives the same mean as before; by how much would they have to reduce the standard deviation to keep their contact?