

3G Hypothesis Testing

1. A company sells fruit juice in cartons. The amount of juice in a carton has a normal distribution with a standard deviation of 3ml.

The company claims that the mean amount of juice per carton, μ , is 60ml. A trading inspector has received complaints that the company is overstating the amount of juice per carton and wishes to investigate this complaint.

The inspector takes a random sample of 16 cartons and finds that the mean amount of juice per carton is 59.1ml.

Using a 5% significance level, and stating your hypotheses clearly, test whether or not there is sufficient evidence to uphold the complaints.

2. A machine produces bolts of diameter D where D has a normal distribution with mean 0.580cm and standard deviation 0.015cm.

This machine is serviced and after the service a random sample of 50 bolts from the next production is taken to see if the mean diameter of the bolts has changed from 0.580cm. The distribution of the bolts after the service is still normal with a standard deviation of 0.015cm.

- a) Find, at the 1% level, the critical region for this test, stating your hypotheses clearly

- b) The mean diameter of a sample of 50 bolts is found to be 0.587mm. Comment on this in light of the critical region