

1. In a production process, the mean time taken to polish the items is 3.6 hours. The manufacturer claims that by using a new technique the time taken to polish can be improved. To test the claim, a random sample of 50 items polished under the new technique is checked and found that the mean time taken to polish is 3.2 hours with a standard deviation of 1.2 hours. Is there any evidence to support the manufacture's claim at the 5% level of significance?  
Answer:  $Z = -2.357$ , reject  $H_0$
2. The manufacturer of a certain oil-additive claims that the mean net weight of jars of his product is 1 kg. A random sample of size 49 of a large consignment supplied to your company is found to have a mean weight of 0.98 kg with a standard deviation of 0.02 kg. Test the manufacturer's claim at the 0.05 significance level.  
Answer:  $Z = -7$ , reject  $H_0$
3. In the past, the average IQ of freshmen in XYZ University was 124. This year, a sample of 100 freshman students was taken from this university and it was found that their average IQ was 125 with a standard deviation of 8. Does this indicate a significant improvement? (Use  $\alpha = 0.05$ )  
Answer:  $Z = 1.25$ , accept  $H_0$
4. Suppose that hourly wages in the chemical industry are normally distributed, with a mean of RM7.60 and a standard deviation of RM0.60. A large company in this industry took a random sample of 50 of its workers and determined that their average hourly wage was RM7.50. Can we conclude at the 10% level of significance that this company's average hourly wage is less than that of the entire industry?  
Answer:  $Z = -1.18$ , accept  $H_0$
5. In 2013, the proportion of people buying personal computers was 65%. In a sample survey of 200 people in 2014, it was found that 139 of them had recently bought personal computers. From the result of this sample survey, is there significant evidence at the 5% significance level to show that the proportion of people buying personal computers in 2014 has increased compared to 2013? State the type of error that could be committed in the above significance test.  
Answer:  $Z = 1.34$ , accept  $H_0$
6. A manufacturer guarantees a certain ball bearing to have a mean outside diameter of 0.8525 inch with standard deviation of 0.0003 inch. If a random sample of 40 bearings from a large lot of these bearings has a mean outside diameter of 0.8529 inch at the 1 percent level of significance does this lot meet the manufacturer's guarantee on the mean outside diameter?  
Answer:  $Z = 8.43$  reject  $H_0$
7. A sales manager for a large corporation claims that the average number of contacts made by the sales persons in the corporation is no more than 16 per week. As a check on this claim, a random sample of 36 sales persons is selected and the number of contacts made by each is recorded for a single randomly selected week. The mean and standard deviation of these 36 measurements were calculated to be 17 and 3 respectively. Test whether there is any evidence to support the sales manager's claim at the 5% level of significance.

Answer:  $Z = 2$ , reject  $H_0$

8. A theory predicts that the probability of an event is 0.4. The theory is tested experimentally and in 400 independent trials the event occurred 140 times. Is the number of occurrences significantly less than that predicted by the theory? Test at the 1% level of significance. Answer:  $Z = -2.043$ , do not reject  $H_0$
9. It is assumed that over half of the employees in a large organisation are in favour of a proposed new wage structure. A random sample of 340 employees found that 56% were in favour. Does this sample verify the assumption? (Use the 5% significance level)  
Answer:  $Z = 2.213$ , reject  $H_0$
10. A manager of a local real estate agency claims that at least 60% of the properties listed with the agency have been sold within two months of the listing date. A random sample of 50 properties listed with the agency last year showed that 28 did sell within two months of the listing date. Is there any evidence to support the manager's claim at the 5% level of significance?  
Answer:  $Z = -0.5774$ , do not reject  $H_0$
11. In a large city 22% of the households had the afternoon newspaper delivered to their doors. After an aggressive marketing campaign to increase that figure, a random sample of 200 households was taken, and it was found that 61 households now have the paper delivered. Can we conclude at the 5% significance level that the campaign was a success?  
Answer:  $Z = 2.9$ , reject  $H_0$