

1. The z-score from a sample of 25 observations for the two-sided test of

$$H_0 : \mu = 64.$$

$$H_a : \mu < 64.$$

has the value $z = -1.84$.

(a) Find the P -value. What conclusion would you draw at the 5% significance level?

(b) Redo part (a) using an alternative hypothesis of $H_a : \mu \neq 64$.

For questions #2-3, carry out a complete hypothesis test using the four-step process.

2. When working properly, a soda machine will dispense soda into cans Normally with a mean of $\mu = 12$ ounces. A quality control engineer is concerned that the machine is under filling the cans. He draws a random sample of 8 cans and records the following amounts:

12.12 11.35 11.51 11.86 11.75 11.45 11.92 12.22

3. A hospital nurse is conducting a study about sleeping habits of four-year-olds. She wonders if they get more sleep than the recommended 8 hours per night. To test her claim, she collects a simple random sample of 12 four-year-olds and asks their parents how much sleep they got last night. Suppose the distribution of the amount of sleep for all four-year-olds is approximately Normal. The results are given below.

| Child | Hrs of sleep |
|-------|--------------|
| 1 | 9.25 |
| 2 | 8.25 |
| 3 | 6.50 |
| 4 | 8.50 |
| 5 | 7.50 |
| 6 | 9.25 |
| 7 | 9.00 |
| 8 | 8.00 |
| 9 | 8.25 |
| 10 | 9.75 |
| 11 | 10.00 |
| 12 | 9.25 |