

Answer on Question #78910 – Math – Statistics and Probability

Question

The breaking strengths of cables produced by manufacturer have a mean of 1800 Kg and a standard deviation of 100 Kg. by a new technique in the manufacturing process, it is claimed that breaking strength can be increased. To test this claim, a sample of 50 cables is tested and it is found that the mean breaking strength is 1850Kg. can we support the claim at the 0.01 significance level?

Solution

$$H_0: \mu \leq 1800$$

$$H_1: \mu > 1800$$

$$\text{Test statistic } z = 3.54$$

$$p\text{-value} = 0.0002$$

Conclusion: reject the null hypothesis.

Interpretation: enough evidence to support the claim.

Question

6. Given that $H_0: \mu \leq 15$

$$H_1: \mu > 15$$

A sample of 40 provides a sample mean of 16.5 and a sample standard deviation of 7

- i. At $\alpha = 0.02$, what is the critical value for z and what is the rejection rule?

Solution

for the two-tailed test at $\alpha = 0.02$, $z_c = \pm 2.054$

reject the null hypothesis if $z \leq -2.054$ or $z \geq 2.054$

Question

- ii. Compute the value of the test statistics z

Solution

$$z = \frac{\bar{X} - \mu_{\bar{x}}}{\frac{\sigma}{\sqrt{n}}} = 1.36.$$