

## Answer on Question #78834 – 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

We need check the hypothesis

$$H_0: \mu = 1800 \quad \text{vs.} \quad H_a: \mu > 1800$$

We use the z-test ( $n > 30$ ):

$$z_0 = \frac{\mu - \mu_0}{\sigma/\sqrt{n}} = \frac{1850 - 1800}{100/\sqrt{50}} \approx 3.54$$

$$z_{cr} = z_{0.99} = 2.33$$

Since  $z_0 > z_{cr}$  then we reject  $H_0$  and we conclude that a new technique can improve the break strength.

**Answer:** we reject  $H_0$  and we conclude that a new technique can improve the break strength.