

Math 5090

8/29/2016

Given a random sample of size 100 with sample mean of 2 from a  $N(\mu, 1)$  population, give a 90% equal tailed confidence interval by doing the following steps. Note that  $z_{0.05} = -1.645$ .

Write an appropriate probability statement.

$$.9 = P\left(-1.645 < \frac{-\bar{X} + \mu}{\frac{1}{10}} < 1.645\right)$$

Rewrite the statement to isolate  $\mu$ .

$$= P\left(\bar{X} - \frac{1}{10}(1.645) < \mu < \bar{X} + \frac{1}{10}(1.645)\right)$$

Write the random interval.

$$\left(\bar{X} - \frac{1}{10}(1.645), \bar{X} + \frac{1}{10}(1.645)\right)$$

Write the outcome of the random interval (i.e. confidence interval)

$$\left(2 - \frac{1}{10}(1.645), 2 + \frac{1}{10}(1.645)\right)$$

Some students used  $\bar{x}$  instead of  $\bar{X}$  in the random interval, and some wrote  $a < \mu < b$  instead of  $(a, b)$  for interval notation. Please use the latter notation in the future. Another common problem was putting  $Z$  in (instead of  $\bar{X}$ ) for the random interval.