Answer on Question #84611 – Math – Statistics and Probability

Question

We would like to conduct a hypothesis test to determine whether the true mean pulse rate of healthy adults differs from 75 beats per minute. Pulse rates of healthy adults are known to follow a normal distribution with standard deviation 10 beats per minutes. We will record the pulse rates of a random sample of 15 healthy adults. It is decided that that null hypothesis will be rejected if X≤ 70.146 or X ≥ 79.854. What is the approximate significance level of the test?

a. 0.02
b. 0.03
c. 0.04
d. 0.05
e. 0.06

Solution

$$\alpha\%CI = \left(\bar{x} - z_{\frac{\alpha}{2}}\frac{\sigma}{\sqrt{n}}, \bar{x} + z_{\frac{\alpha}{2}}\frac{\sigma}{\sqrt{n}}\right) = (70.146, 79.854).$$

So, $2z_{\frac{\alpha}{2}}\frac{\sigma}{\sqrt{n}} = 79.854 - 70.146 = 9.708 \rightarrow z_{\frac{\alpha}{2}} = \frac{9.708*\sqrt{15}}{2*10} = 1.880.$

Thus, the significance level, $\alpha = 0.0601$. The approximate sigmnificance level of the test is e) 0.06.