Answer on Question #44301 – Math - Statistics and Probability

Problem.

In a random sample of 12 residents of Benton the mean waste recycled per person was 1.3 pound with a standard deviation of 0.25 pounds. What is the 80% confidence interval for the mean waste recycled per person?

Solution.

Assume the population standard deviation is known.
Therefore, z^*-value for 80% confidence level equals $z^* = 1.28$.
If $n = 12$ is number of residents, $\bar{x} = 1.3$ is mean and $\sigma = 0.25$ then the confidence interval for mean waste recycled per person is

$$\left(\bar{x} - z^* \frac{\sigma}{\sqrt{n}}; \bar{x} + z^* \frac{\sigma}{\sqrt{n}}\right).$$

and equals

$$\left(1.3 - 1.28 \cdot \frac{0.25}{\sqrt{12}}; 1.3 + 1.28 \cdot \frac{0.25}{\sqrt{12}}\right), \text{ i.e. } (1.208; 1.392).$$

Answer: $(1.208; 1.392)$.