

Answer to Question #84597 – Math – Statistics and Probability

Question

Suppose the diameter x of a rod has normal distribution $N(2,16.0)$. If the diameter x satisfies $1.2 \leq x \leq 8.1$, then it is non-defective. Find the probability that the rod is non-defective.

Solution

$$z = \frac{x - \mu}{\sigma}$$

$$z_1 = \frac{x_1 - \mu}{\sigma} = \frac{1.2 - 2}{4} = 0.2$$

$$z_2 = \frac{x_2 - \mu}{\sigma} = \frac{8.1 - 2}{4} = 1.53$$

$$P(1.2 \leq x \leq 8.1) = P(0.2 \leq z \leq 1.53) = P(z_2) - P(z_1) = 0.937 - 0.5793 = 0.3577.$$

Answer: 0.3577.