Answer for Question #42055, Math, Statistics and Probability

Problem:

In measuring user reaction time to the mouse movement, a psychologist estimates that the standard deviation is 0.05 second. How large a sample measurements must he take in order to be 95% confident that the error in his estimate of mean reaction time will not exceed 0.01 second?

$SD = 0.05; a = 0.95; e = 0.01; N-?$

Solution:

The confident level $a = 0.95$ means that the error $e = 0.01$ should be equal to 2 standard errors (SE):

$$2 * SE = e; \quad SE = \frac{e}{2} = 0.005;$$

From the other side:

$$SE = \frac{SD}{\sqrt{N}}; \quad N = (\frac{SD}{SE})^2 = 100$$

Answer: N=100.