Standard error

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Find standard error for standard deviation 35 cm and $n = 49$. [2 marks]

$\frac{35}{\sqrt{49}} = 5$.

Answer: 5 cm.

2. Population variance is 144. Find standard error when $n = 36$. [2 marks]

First $\sigma = \sqrt{144} = 12$; then $\frac{12}{\sqrt{36}} = 2$.

Answer: 2 units.

3. Standard error is 0.6 and $n = 81$. Recover population standard deviation. [2 marks]

$0.6\sqrt{81} = 5.4$.

Answer: 5.4.

4. For standard deviation 10, find the smallest n giving standard error at most 1.2. [2 marks]

$n \geq \left(\frac{10}{1.2}\right)^2 = 69.444\ldots$; round up.

Answer: 70.

5. A report calls $\frac{8}{\sqrt{400}} = 0.4$ the population SD. Correct it. [2 marks]

The division by the square root of sample size converts individual spread to mean spread.

Answer: 0.4 is the standard error of the mean; population SD is 8.

6. Compare standard errors for $n = 25$ and $n = 100$ from one population. [2 marks]

The ratio is $\sqrt{\frac{25}{100}} = \frac{1}{2}$.

Answer: The second is half the first.