

Answers: Introduction to confidence intervals

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Summary

Answers to questions on introduction to confidence intervals.

These are the answers to [Questions: Introduction to confidence intervals](#).

Please attempt the questions before reading these answers!

Q1

1.1. 95% or 0.95

1.2. 90% or 0.90

1.3. 93% or 0.93

Q2

2.1. $Z_{\alpha/2} = 1.960$

2.2. $Z_{\alpha/2} = 1.645$

2.3. $Z_{\alpha/2} = 1.8119$

Q3

3.1.

- $n = 178$
- $\bar{x} = 14$ g
- $s = 0.75$ g
- $\alpha = 0.01$

▪ $Z_{\frac{\alpha}{2}} = 2.576$

3.2. The margin of error is

$$\left(\frac{2.576 \cdot 0.75 \text{ g}}{\sqrt{178}} \right) = 0.145 \text{ g} \quad \text{to 3dp}$$

and so the 90% confidence interval for this sample is [13.855 g, 14.145 g].

3.3. It's likely with 99% confidence that the population mean of the weights of their chocolate swirls is between 13.855 grams and 14.145 grams.

Q4

For these data:

4.1. 90%CI = [30.14, 31.86]

4.2. 95%CI = [29.98, 32.02]

4.3. 99%CI = [29.66, 32.34].

Q5

The sample mean is $\bar{x} = 100.3$. The margin of error error is 2.2, and $Z_{\alpha/2} = 1.645$. The sample size is $n = 121$, and so $\sqrt{n} = 11$. So $s = 14.71$ is an estimate for the sample standard deviation.

These are only estimates as the confidence interval could have been rounded, so this sample mean and standard deviation could have some errors either way.

Version history and licensing

v1.0: initial version created 12/25 by Millie Harris as part of a University of St Andrews VIP project.

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