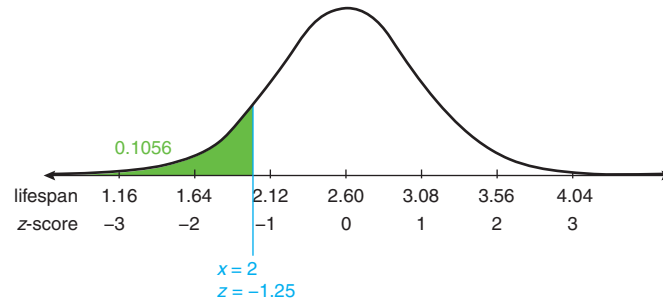
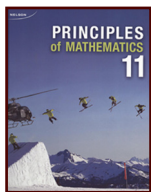


$$\begin{aligned} \text{b. } z &= \frac{x - \mu}{\sigma} \\ z &= \frac{2 - 2.6}{0.48} \\ z &= -1.25 \end{aligned}$$



There is approximately a 10.56% chance that Tyler's MP3 player will fail before his extended warranty would expire.

Lesson 6.4: Confidence Intervals



Refer to *Principles of Mathematics 11* page 302 for more examples.

- Page 302, #1, 3, 4, 6, 9a, and 10.

Question 1, page 302

- The confidence level is 19 times out of 20, or 95%.
- $81\% - 3.1\% = 77.9\%$ and $81\% + 3.1\% = 84.1\%$, so the confidence interval is from 77.9% to 84.1%.
- $0.779 \times 33\,500\,000 = 26\,096\,500$ and $0.841 \times 33\,500\,000 = 28\,173\,500$, so there were likely between 26.1 million and 28.2 million people that knew climate change is affecting Inuit more than the rest of Canadians.

Question 3, page 302

- a. The confidence level is 9 out of 10, or 90%
- b. $64\% - 3.4\% = 60.6\%$ and $64\% + 3.4\% = 67.4\%$, so the confidence interval is from 60.6% to 67.4%.
- c. $0.606 \times 32 = 19.392$ and $0.674 \times 32 = 21.568$, so approximately 19 to 22 students could expect better checkups.

Question 4, page 302

- a. You can conclude that the true percentage of Canadians who support bilingualism and want Canada to remain a bilingual country will be between 78.8% and 83.2%, with 95% confidence.
- b. Responses will vary, a sample is shown.

It is difficult to determine if the poll is flawed without additional information. We don't know whether Canadians from all provinces and territories were surveyed. However, it is possible that many people that only speak one language still feel it is reasonable for Canada to support both languages.

Question 6, page 303

- a. The confidence level is 99 out of 100, or 99%. $89\% - 4.3\% = 84.7\%$ and $89\% + 4.3\% = 93.3\%$, so the confidence interval is from 84.7% to 93.3%.
- b. $0.847 \times 23\,500\,000 = 19\,904\,500$ and $0.933 \times 23\,500\,000 = 21\,925\,500$, so between 19.9 million and 21.9 million people would recycle their cell phone if it was convenient.

Question 9a, page 304

$54\% - 4.5\% = 49.5\%$ and $54\% + 4.5\% = 58.5\%$, so you can say with 90% confidence that between 49.5% and 58.9% of post-secondary graduates expect to earn over \$100 000 by the time they retire.

Question 10, page 304

- a. The more people that are sampled, the more representative of the population they are. This means the predicted value should be closer to the true value and there will be a smaller margin of error.
- b. In order to have a large confidence level you need a large confidence interval. That is, you can be very sure the true value will be within the confidence interval if the confidence interval is large enough.