

## Problem 73

(a) How many significant figures are in the numbers 99 and 100.? (b) If the uncertainty in each number is 1, what is the percent uncertainty in each? (c) Which is a more meaningful way to express the accuracy of these two numbers: significant figures or percent uncertainties?

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### Solution

99 has two significant figures, and 100. has three significant figures. Divide the uncertainty by each number and multiply by 100% to get the percent uncertainty.

$$\text{For 99 :} \quad \frac{1}{99} \times 100\% \approx 1.01\%$$

$$\text{For 100. :} \quad \frac{1}{100} \times 100\% = 1.00\%$$

Percent uncertainties are more useful because they are a numerical measure of how inaccurate a measurement is. As another example, the number 14 also has two significant figures; only by looking at the percent uncertainty do we see how inaccurate the measurement is.

$$\text{For 14 :} \quad \frac{1}{14} \times 100\% \approx 7.14\%$$