

Measurement Error
by
Your Name & Lab Partner Name

Normal ruler

Trial	Rod Length (cm)
1	4.5
2	4.7

Calculations

Average Length = sum of data / number of data
 $= (4.5 + 4.7)/2 = 4.6 \text{ cm}$

Questions

1a. Explain the possible sources of error in these measurements

Don't write out the question. Instead, list the question number and answer in complete sentences.

1a. One possible source of error in the rod length measurements occurred with the alignment of the "zero" mark of the ruler with the end of the rod. Also, rotating the rod or having a different person measure the length produced variation. Another source of error could be due to the precision of the ruler; the divisions of the ruler could be smaller to obtain less variation.

Conclusion

*Summarize in one or two paragraphs the main things one learns (or does not learn) from **your data**. Quote actual data to support what you conclude. State facts, likethis was found to be larger by a value ofor....the 2nd order spectrum was not observed. Do not describe what you did. Do not be vague, like the ball fell really fast. Do not be personal, like I learned how to use an oscilloscope.*

Based on the rod measurement data, the difference between accuracy and precision is evident. The average length obtained from both normal and special rulers could be written to 2 significant digits based on the uncertainty of 0.1 cm, so the precision was identical for both rulers. Yet, the average values 4.4 cm and 4.6 cm for the special ruler and normal ruler respectively did not agree within this precision. However, which average value was accurate was not established.

The most uncertain measurement was the flame height at $\pm 1 \text{ cm}$. In the case of the flame it was not the measuring instrument but the object, the flame itself, which caused the high variation.