Lecture 5

Friday, September 13, 2024 3:33 PM

Error of measurement

Source of error:

- Random error: unpredictable
  For example, you shoot an arrow to a target. You won't hit the target at the same point even though you try hard to hold the same position. Another example: you weigh an object on the scale and then round the weight to the closest whole number. Sometimes, the weight is rounded up. Sometimes, the weight is rounded down.
- Systematic error: the measured valued is consistently much lower or much higher than the exact value. For example, you want to find out the average income of an American household by doing a survey in a rich neighborhood. It would be better to do survey in an "average" neighborhood where rich and poor people are mixed in.

Representation of error:

- Absolute error = measured value - true value
  Absolute error carries the physical unit.
- Relative error = (measured value - true value)/(true value)
  Relative error doesn't carry the physical unit and is usually written in percentage. It is more commonly used than the absolute error.

Do some problems on the worksheet.