

Math 1030 #7b

Dealing with Uncertainty

Types of Error

How accurate are the numbers we read and hear in the media?

Error

Random errors - due to random and inherently unpredictable events in the measurement process.

Systematic errors - a problem in the measurement system that affects all measurement in the same way.

Size of Error

absolute error = measured value - true value

$$\text{relative error} = \frac{\text{absolute error}}{\text{true value}}$$

- When a systematic error is found, then all measurements can be changed to reflect the correction of this error.
- One way to minimize random error is to take multiple measurements and average the measurements

EX 1:

What are some sources of random and systematic error in the following?

- a) Number of Skittles in a package

- b) Hours of sleep as reported by a group of high school students

EX 2:

Calculate the actual and relative error in the following.

- a) The weight on a package of cat food says 15 lbs , but it is actually 15.4 lbs.

- b) The votes counted for a particular candidate were 2795 . It was later determined that 3 votes had been counted twice.