

## HOMEWORK 2

### Error Analysis

- Five students measure the mass of an object by making two separate measurements each. These measurements, in grams: 9.80, 9.87, 9.89, 9.95, 9.91, 9.98, 9.92, 10.05, 9.97, 9.84.

A) Calculate the mean, the mean absolute error, the mean relative error, and write down result in round off form using your calculator and the formulas from the Physics Laboratory Manual.

B) The manufacturer of the mass claims that the mass is 10 g, within 0.4%. From your calculated results determine is this a valid claim.

- Suppose the number of cosmic ray particles passing through some detecting device every hour is measured nine times and the results are those in the following table.

measurement	1	2	3	4	5	6	7	8	9
# of particles	80	95	100	110	90	115	85	120	105

Conduct error analysis and present result in round off form.

- To measure the volume of a rectangular object, an experimenter measures the object's length (L), width (W), and height (H) for five times and the results are presented in the table.

measurement	1	2	3	4	5
L/m	0.2	0.22	0.231	0.199	0.213
W/m	0.32	0.331	0.298	0.312	0.305
H/m	0.45	0.462	0.448	0.439	0.454

Calculate the average volume in meters and centimeters, the mean relative error, the mean absolute error in meters and centimeters, and present result in round off form.