

MISTAKES KEY – EXP 1 – MEASUREMENTS

This lab is worth 15 points.

- A - [1/2 pt] Units were omitted
- B - [1 pt] Absolute error omitted
- C - [1 pt] Percentage error omitted
- D - [1/2 pt, 1 pt max total] Math error
- E - [1/2 pt] Units were not correct
- F - [1/2 pt] Not enough significant figures – you can read your tool more precisely than what is reported
- G - [1 pt] Absolute error is estimated incorrectly – see also J below.
- H - [1/2 pt] Computed percentage error from absolute error incorrectly
- I - [1 pt if done twice] Computed the absolute error from the percentage error incorrectly
- J - [1/2 pt] Number of significant digits after the decimal in the absolute error should be the same as in the measured value
- K - [1 pt] When subtracting, the answer's absolute error should be the sum of the absolute errors. See ♣ on page 1-2. Then compute the percent error.
- L - [1/2 pt] The final thickness should be $\frac{1}{2}$ the difference of the inside & outside diameters
- M - [1 pt] When multiplying or dividing by an exact number, the percent error is unchanged. The absolute error does change. This applies to the thickness and radius, both of which you computed by dividing by exactly 2.
- N - [1 pt] When multiplying or dividing by inexact numbers, the percent error in the answer is the sum of the percent errors. See ♣♣ on page 1-2. This applies to exponents, as well. (Squaring = multiplying a number by itself.)
- O - [1/2 pt] The scales we used are not accurate to more than 0.1 grams, probably 0.2-0.3 grams. (0.4 grams is acceptable.)
- P - [1/2 pt] Value is unreasonably large or small – check to make sure your numbers seem realistic. 1 cm^2 is about the size of a fingernail (pink + white parts). Water has a density of 1 g/cm^3 . Solids are about 10 times more dense than water, gases about 1000 times less dense than water.
- Q - [1 pt] No justification given for your choice of absolute error on the Vernier caliper.

$\frac{1}{2}$ pt penalty if your answer about why your percentages were not 66% and 95% was not quite right, but on the right track. 1 pt penalty for a bad or missing answer.

1 pt penalty if you didn't calculate the standard deviation of the knuckle widths

$\frac{1}{2}$ pt penalty if you didn't calculate the number of data values within 1 or 2 standard deviations of the average.

Your grade may be higher than the above penalties indicate. Multiple occurrences of the same mistake were not penalized as heavily, and scores below 9.5 points were adjusted upwards by $\frac{1}{2}$ pt and those below 7 pts were adjusted upwards by 1 pt.