
Due by 5 pm February 8 (brown homework cabinet in G2B66)

(do not use the “provisional rules” in Taylor’s book!)

1. (3 points) The radius of a sphere is measured to be $2.00 \pm 0.04 \times 10^{-6}$ m. What is the fractional error on the surface area of the sphere? What is the absolute error on the surface area of the sphere?

2. (3 points) $R$ is measured to be $4.23 \pm 0.08$ ohms. $I$ is measured to be $9.5 \pm 1$ Amps. If $V = IR$, a) what is fractional error in $V$? b) report $V$ and $\delta V$ in standard format.

3. (3 points) Given the “Master Rule” (from lecture notes, or Taylor eqn 3.47), show that for $f=x/y$, $\delta f/f = [(\delta x/x)^2 + (\delta y/y)^2]^{1/2}$.

4. (3 points) $F = 60 \pm 2$ Newton. $k = 300 \pm 3$ Newtons/meter, and $S=F/k$. What is $S$ and $\delta S$, reported in standard format?

5. (3 points) $A = 5.2 \pm 0.7$ cm, $\theta = 34.2 \pm 0.2$ degrees, and $P(A,\theta) = A \cos(\theta)$. Use the master rule to determine $P$ and $\delta P$. And report in standard format. Hint, if you try to do anything that is related to calculus and trigonometry, think “radians”, not “degrees”.