Convention: Q1.3 means number 3 in the “question” section at the end of chapter 1 of Serway and Beichner. P1.3 means number 3 in the “problem” section. I recommend trying several problems in chapters 2 and 3 of Elby (The Portable TA) before starting the homework.

I disagree with Serway’s definition of the word “accuracy” on page 15 and his usage in the figure caption on page 13. Most scientists distinguish the terms “accuracy” and “precision,” and Serway has mixed them up. Precision, not accuracy, denotes the number of significant figures. Accuracy indicates whether a measurement is correct. For example, suppose a very careful measurement of a rod determines its length to be 5.661 cm. A less precise measurement might come up with 5.7 cm. If someone else measures 5.12103 cm, he’s being more precise but less accurate (assuming the first measurement was correct).

1–2. Q1.2, Q1.5. For example, $A$ might represent the length of a bar, $B$ its mass.


5. Estimate (order of magnitude, that is, good up to a factor of 10) the volume of your body (for which it is sufficient to model yourself as a collection of cylinders and spheres). Now measure your mass (indirectly, by weighing yourself). Approximately what is your average density? How precise is the quantity you calculate? How does it compare to the density of water?

6. Do the unnumbered exercise at the end of example 2.8 on p.39.

7–8. Q2.5, Q2.6

9–13 P2.3, 2.15, 2.20, 2.22, 2.34. FIRST, do this problem for a bullet of length $\ell$ whose initial velocity is $v_i$ and whose final velocity is $v_f$ after passing through a board of thickness $L$. THEN plug in the numbers suggested. Note that the assumption of constant deceleration is necessary to solve part b as well as part c.

14–15 P2.66, 2.70

Optional question for those with an interest in biology: normally, I like Elby’s approach (in The Portable TA), but I’m cross at him over his very first problem, 1.1. Why?