

Anatomy of An Answer

We need to do a lot of calculations in physics. Simply writing down the correct final answer is **not** good enough. You must communicate that you understand everything about the question, and prove that you know what you are doing. Use the following example as a template for how you will answer calculation questions. If you get into the habit of looking at calculation questions this way you will have far more success in the course. **Failure to follow these guidelines will result in mark deductions!**

1. The directing word "**determine**" means you'll be calculating something. You're required to show all your work.

2. A list of all given and required info is shown. Notice that the velocity was converted to m/s, and a bunch of extra digits are shown. **Never use rounded numbers in your calculation.**

Determine the displacement of a car that moves at 54.7 km/h for 105.0 s.

$$d = ? \text{ m}$$

$$v = 54.7 \text{ km/h} = 15.1944 \text{ m/s}$$

$$t = 105.0 \text{ s}$$

$$\text{SigDigs} = 3$$

$$v = \frac{d}{t}$$

$$d = vt$$

$$d = 15.1944(105.0)$$

$$d = 1595.416667 = 1.60\text{e}3 \text{ m}$$

4. The formula as it appears on the data sheet. You are not required to put all the arrows above the letters.

5. The manipulated formula and the unrounded substituted numbers.

3. The number of sig digs allowed for the answer, based on the sig digs of the **original** numbers that will actually be used in the calculation.

The car traveled 1.60e3 m.

7. A final statement. Although not always necessary, it is not a bad idea. You must still show the correct sig digs and units.

6. The final answer. It is first written down unrounded, in case it is needed for further calculations. **Always use the unrounded number.** The final answer is then given with correct sig digs. This meant that it was also necessary to use scientific notation. Finally the correct units are shown. Never show a final answer as a fraction (that's "exact math" and we are "s.d. physics." **If any of this is wrong, the entire answer is considered to be wrong!**)

Notice that the entire response is laid out in a neat, logical, and orderly fashion. Not only does this look better, it will help you answer questions more easily. This will result in higher marks.