Homework Rubric, Math 367

Part of the course is in getting the solutions to the homework, but part of the course is also in our ability to communicate that solution. Below is a rubric for how I will be grading your homework, with an example.

1. Use complete sentences.
2. Encapsulate the exercise so that the homework submission is self contained- That is, incorporate the problem statement into the solution.
3. You can use the book as a guide for how to write the solutions- Look carefully at how examples are written up.
4. Carefully written or typed (penmanship!).
5. Think about how the exercise may relate to other exercises, or think about why you're doing that particular exercise.

Example

Exercise 1.2.7
Using the alternate formulation of the Fundamental Theorem of Calculus,

$$\frac{\partial}{\partial b}\int_a^b f(x)\,dx = f(b),$$

we can provide a different derivation of the heat equation from that given on p. 5 of the text. Recall that by considering the total heat energy of a segment of wire, Equation 1.2.4 was:

$$\frac{d}{dt}\int_a^b e(x,t)\,dx = \phi(a,t) - \phi(b,t) + \int_a^b Q\,dx$$

Now we can re-write

$$\phi(a,t) - \phi(b,t) = -\int_a^b \phi_x(x,t)\,dx$$

and bringing in the derivative, we can write Equation 1.2.4 as

$$\int_a^b e_t\,dx = -\int_a^b \phi_x\,dx + \int_a^b Q\,dx$$

Now differentiate both sides at an arbitrary location b using the alternate form of the FTC to get:

$$e_t(b,t) = -\phi_x(b,t) + Q(b,t)$$

And since b was arbitrary, we can replace b by the usual x. This gives Equation 1.2.5, and the remaining steps are the same as the textbook (introducing specific heat and Fourier's Law).

Grading Rubric

Maximum score per problem is 5 points.

- 4 pts: Complete and correct solution.
- 3 pts: Incorrect solution because of minor errors.
- 2 pts: Incorrect solution because of fundamental errors.
- 1 pt: Attempted solution
- 0 pts: No attempt
- +1 for writing style.