Homework Information and Format

Author: John M. Cimbala, Penn State University. Latest revision, 11 August 2021

Homework Philosophy

One of the best ways to learn something is through practice and repetition. Therefore, homework assignments are extremely important in this class! Homework sets are carefully designed to be workable yet challenging. All homework assignments are *comprehensive*. If you study and understand the homework, you should not have to struggle with the exams.

Homework Policy

The due date for each homework assignment is clearly indicated on the course website. Homework turned in late will receive partial credit, according to the following rules:

- 10% off if turned in late, but before 8:00 a.m. on the first school day after the due date.
- 25% off if turned in late, but before 5:00 p.m. on the first school day after the due date.
- 50% off if turned in late, but before 5:00 p.m. on the second school day after the due date.
- No credit if turned in after two school days beyond the due date.

Exceptions are made under certain circumstances (illness with doctor's note, death in the family, etc.). Instructor's solutions will be made available within a week after the due date (typically after the 50%-off turn-in date).

Students may work together on the homework assignments in study groups (to help each other), provided that ***each person in the group is contributing to each solution***. If students choose to work in a group, a homework solution needs to be submitted for **each student** individually, with all students in the group listed on the cover page. ***No copying***. Note that homework counts for a considerable portion of your final course grade, so it is critical that you understand how to solve the homework problems.

Homework Format

For ease of grading, and for consistency, each homework set *must* be submitted in the following format:

1. Print out the homework assignment cover page from the web page, and staple it to the completed homework. This page serves as the cover page for the student's completed assignment.
2. Write your name in the appropriate place on the cover page, along with the name(s) of students with whom you worked.
3. Use only 8-1/2 x 11" paper.
4. Do not rip out paper from a spiral notebook unless you cut off all the messy fringes and frays.
5. Staple all pages together in upper left corner (no folders please).
6. One problem per page is preferred, but short problems can be combined on one page. If so, draw a **dark line** between problems to separate them.

Problem Format

For ease of grading, and for consistency, each problem *must* be submitted in the following format:

1. Write down the problem number and encircle it.
2. Include these three parts for each problem:
   - ***Given***: Summarize the problem at hand, including any relevant sketches, dimensions, and given information.
   - ***To do***: State briefly what is *unknown*; i.e. what is the goal of the problem?
   - ***Solution***: Present a step-by-step solution of the problem. ***Show all of your work!*** Explain your assumptions, and indicate where equations come from (e.g., "...From the definition of volume flow rate, Eq. (2.24), it is seen that ..."). As you go along, include equation numbers so the grader can follow your work. Always include units (if appropriate) in any calculations, and put a box around the final answer. Never give an answer with more significant digits than the minimum number of significant digits provided in the problem statement. If the number of significant digits is not clear from the problem statement, give your answer to three significant digits. (Only rarely are more than three significant digits relevant in engineering analyses.)
3. Set your final answer(s), **each encircled by a box** at the right edge of the page so that your answer can be clearly spotted by the grader.

See next page for a sample homework problem and solution in the proper format →

Sample Homework Problem in Required Format

This is a sample homework problem, illustrating the format in which you are required to submit your homework. Failure to conform to this format will result in a warning. Repeated failure to conform to this format will result in a grade penalty. *Note*: You are not required to type your homework solutions.

Consider this sample homework problem statement, which is Problem 2 of a sample homework assignment:

> **2.** (10 pts) A small village draws 1.00 acre·ft/day of water from its reservoir. Convert this water usage to (a) gallons per minute and (b) liters per second.

Here is the solution, in the format required for this course: [Comments in red and in square brackets are for your information only – you would not be required to write these.]

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②   [Note that the problem number is clearly defined on the page – to make it easier for the grader.]

Given: A village uses 1.00 acre·ft/day of water. [We use the notation $\dot{V}$ for volume flow rate – the font V is used for volume, and is distinguished from the font V used for velocity.]

To do: Calculate the water usage (i.e., volume flow rate) in (*a*) gal/min, and (*b*) L/s.

Solution: Use known conversions, and conversions from references. [We know that 1 day = 24 hr., 1 hr. = 60 min., 1 min. = 60 s. Also, from references we find that 1 ft = 0.3048 m, 1 acre = 4.0469×10^3 m^2, and 1 gal = 3.7854×10^{-3} m^3 = 3.7854 L.]

(*a*) [Note: The proper (and least confusing) way to do conversions is with ***unity conversion ratios*** as shown here.]

$$\dot{V} = \left(\frac{1.00 \text{ acre} \cdot \text{ft}}{\text{day}}\right)\left(\frac{4.0469 \times 10^3 \text{ m}^2}{\text{acre}}\right)\left(\frac{0.3048 \text{ m}}{\text{ft}}\right)\left(\frac{1 \text{ gal}}{3.7854 \times 10^{-3} \text{ m}^3}\right)\left(\frac{1 \text{ day}}{24 \text{ hr}}\right)\left(\frac{1 \text{ hr}}{60 \text{ min}}\right) = 226.289 \ \frac{\text{gal}}{\text{min}}$$

Or, to three significant digits,

$$\boxed{\dot{V} = 226. \ \frac{\text{gal}}{\text{min}}}$$

[Note: The number of significant digits (3) is clearly defined in the above problem statement. In cases in which the number of significant digits is not clear, the standard engineering assumption of three significant digits is assumed. Never give your *final* answer to more significant digits than that implied by the problem. However, it is wise to write down several additional digits when the value is needed for subsequent calculations, as illustrated below.]

(*b*) Converting to SI units,

$$\dot{V} = 226.289 \ \frac{\text{gal}}{\text{min}}\left(\frac{3.7854 \text{ L}}{\text{gal}}\right)\left(\frac{1 \text{ min}}{60 \text{ s}}\right) = 14.2766 \ \frac{\text{L}}{\text{s}}$$

Or, to three significant digits,

$$\boxed{\dot{V} = 14.3 \ \frac{\text{L}}{\text{s}}}$$

[Notice that the final answers are boxed – to make it easier for the grader.]