

ME 199A REQUIRED FORMAT FOR HOMEWORK SOLUTIONS

Perhaps the most important thing you will learn as an engineering student is how to solve problems. Your solutions should contain each of the sections below (Given, Required, Solution, Discussion):

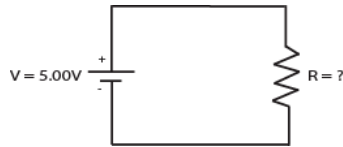
Given	<ul style="list-style-type: none">• Rewrite the problem statement on your paper and draw a sketch of the geometry or problem to be analyzed.• Clearly tabulate all of the given information, such as current, voltage, dimensions, material properties, forces, etc.
Required	<ul style="list-style-type: none">• Identify the unknown quantity (or quantities) to be determined.
Solution	<ul style="list-style-type: none">• Draw additional sketches of the body to aid in your solution if needed.• Apply the appropriate principles and equations (IDENTIFY the principles and equations that you will employ)• Report the answer with the appropriate number of significant digits with the appropriate units.• Place the final answer in a box, and underline important intermediate results when applicable.
Discussion of Results	<ul style="list-style-type: none">• Study the answer to see if it is reasonable, and give any limitations of the solution.

Other Requirements:

- (1) Solutions should be NEAT.
- (2) Solutions should be completed on engineering paper (yellow, green or white) or on white printer paper (with no lines).
- (3) Put problems in the order they are assigned.
- (4) Number all pages in the upper right hand corner of the paper. For a 5 page assignment, the first page would be numbered 1/5, the second page would be numbered 2/5, and so on.
- (5) The use of Mathcad to complete all or part of a homework assignment is encouraged.
- (6) A properly formatted problem must include the proper units throughout the solution.
- (7) Each problem should begin on a new page; there should never be more than one problem per page, although long problems may span multiple pages.

Assume the following problem was assigned for homework assignment #1.

5. For the circuit shown below, determine
- (a) the resistance R if the current supplied by the battery is 0.300 A .
 - (b) the number of electrons that leave the battery over a 5 minute period assuming the current is constant.



* Number all pages of solution - page 5 of a solution with 7 pages

A hand-worked example of the homework solution you should submit is provided below. This example follows "Engineering Format."

Number the problem

5/7

⑤ GIVEN: For the circuit shown below, determine

- ① the resistance R if the current supplied by the battery is 0.3 A .
- ② the number of electrons that leave the battery over a 5 minute period.

5V

REQUIRED: ① R
② electrons leaving battery (e)

SOLUTION:

① Find R from ohm's Law: $V = IR$

$$R = \frac{V}{I} = \frac{5\text{V}}{0.3\text{A}} = 16.7\ \Omega$$
① $R = 16.7\ \Omega$
* Box Answers

* Be careful not to use too many digits in your answers

② Use definitions of an amp (A) and a coulomb (C)
 $A = \frac{C}{s}$ and $C = 6.28(10)^{18}$ electrons * Show all units, even for intermediate calcs.

electrons = $0.3\text{A} \left[\frac{s}{A} \right] \frac{6.28(10)^{18} e}{C} \left[5\text{min} \right] \frac{60s}{\text{min}}$

electrons = $5.65(10)^{20}$

DISCUSSION: The answers are reasonable. A battery would not provide a perfectly steady current however.