

Problem: A metal bar with length L , mass m , and resistance R is placed on frictionless, metal rails that are inclined at an angle ϕ above the horizontal. The rails have negligible resistance. A uniform magnetic field of magnitude B is directed vertically downward. The bar is released from rest and slides downward.

Approach: Give an introduction to the physics of the problem and a brief summary of the history of the underlying physics principles. Define the problem, introduce all variables, and draw figures. Derive the terminal speed of the bar. What is the induced current in the bar when the terminal speed has been reached? At what rate is work being done on the bar by gravity after the terminal speed has been reached?

Format:

1. Title page with title of report, your name, etc.
2. Abstract (1/2 page of a summary stating the main points of the report)
3. Introduction: Elaborate on the history of the problem chosen, eventually the relevant scientists' biographies
4. Main body: present your main work here. Be specific, show figures, use equations.
5. Conclusions: (1/2 page) what are the essential physical ideas you used?
6. Bibliography: cite the references used!

Do not provide a copy of some writing from the Internet. I expect an elaboration of a problem in the context of our class, using the language and tools we studied.

Grading:

- 1/3 on presentation: structure and line of thought, clarity of figures, etc.
- 1/3 on research of literature, background reading.
- 1/3 on individual contributions/creativity: How much own understanding, not just quoting from the textbook, did you put into this work?

The report contributes 10% to your entire grade.