

# General Physics Laboratory I

Week 04: Report Guideline

Experiment 4. Two Dimensional Motion

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# General Report Guideline

1. You can use either Korean or English.
2. I suggest you to write a report with a language with which you can write rigorously. (There is no need to be shy about writing in Korean)
3. However, do not mix two languages. (ex: newton's law는 다음과 같이... → X)
4. No more than 5 pages. The font size must be greater than 9 pts.
5. Only \*.doc, \*.docx, \*.hwp extensions are allowed.
6. Do not make a cover page.
- 7. Do not repeat the details in the manual.**
8. Make the report simple but it should contain rigorous answers. / **You should merge different data in one plot.**
- 9. If you suggest the origin of the error, please show your quantitative justification. (No quantitative explanation → No points)**
10. You have to cite every source of theory and information beyond the manual.
11. Clarify a theme and a purpose of each part.

## 4. Two Dimensional Motion

1. Abstract (5pts, < 300 words)
2. Introduction (10pts): Show your conceptual understanding about the subject.
3. Theoretical Background (10pts)
  - ✓ (5pts) Explain **constant velocity** and **constant acceleration** motions in 2D. Give the general equation of the x-t, y-t graph in 2D plane on a slope.
  - ✓ (5pts) Explain **momentum conservation** in 2D. Give the general equation of the **two body collision** in 2D.
4. Methods (5pts)
5. Results (20pts)
  - ✓ (5pts) Linear motion in constant velocity: Plot x-t, y-t graphs with linear and quadratic trendlines. Find velocity and acceleration.
  - ✓ (5pts) Linear motion in constant acceleration: Plot y-t graphs with a quadratic trendline.
  - ✓ (5pts) Collision of two bodies: Show the trajectory of the two pucks by plotting y-x graph with moving direction.
  - ✓ (5pts) Collision of two bodies: Plot x-t, y-t graphs with linear and quadratic trendlines. Find velocity vectors of each puck before and after collision.
  - ✓ Each graph should include **the axis labels**.
6. Discussion (30pts)
  - ✓ (10pts) Linear motion in constant velocity: How can we claim that it is a constant velocity motion?
  - ✓ (10pts) Linear motion in constant acceleration: Find the acceleration and gravitational acceleration with mean values and standard deviations.
  - ✓ (10pts) Collision of two bodies: Plot  $p_{x,tot}-t$ ,  $p_{y,tot}-t$ ,  $E_{tot}-t$  and discuss conservation of momentum and energy.
  - ✓ (Additional) Discuss about your own question and analysis.
7. Conclusion (10pts): Summarize the report effectively.
8. References (10pts)