

Geometrical Optics

PHYS 2202: Wave Motion and Optics

Lab Section A2

Winter 2024

Camila Restrepo

101230443

Carleton University

January 29, 2024

0. Contents

1	Introduction	3
1.1	Objectives	3
1.2	Thin Lens Equation	3
1.2.1	Limits at Infinity	4
1.2.2	Using Magnification	4
1.3	Lensmaker Equation	4
2	Experimental setup	6
2.1	Apparatus	6
2.2	Procedure	6
3	Observations	7
3.1	Object at Infinity	7
3.2	Mirror Method	7
3.3	Lensmaker Equation	8
3.4	Thin Lens Equation	8
3.5	Magnification and Thin Lens: Vertex Pointers	8
4	Data analysis	10
4.1	Distant Object	10
4.2	Mirror Method	10
4.3	Thin Lens (Imprecise)	10
4.4	Thin Lens and Magnification	10
4.5	Lensmaker	10
5	Results	11
6	Discussion	12

2. Experimental setup

2.1 Apparatus

The instruments used were as follows:

- A biconvex BK7 glass lens with refractive index 1.51502
- Four vertex pointers of length $(152.47 \pm 0.02)\text{mm}$
- A mirror
- A screen
- A metre stick ($\pm 0.5\text{ mm}$)
- A ruler (0 to 30cm) ($\pm 0.5\text{ mm}$)
- A G&G Spherometer (-8 to 8mm) ($\pm 25\text{ }\mu\text{m}$) with a leg-to-screw distance of 22.5 mm (measured by ruler)

2.2 Procedure

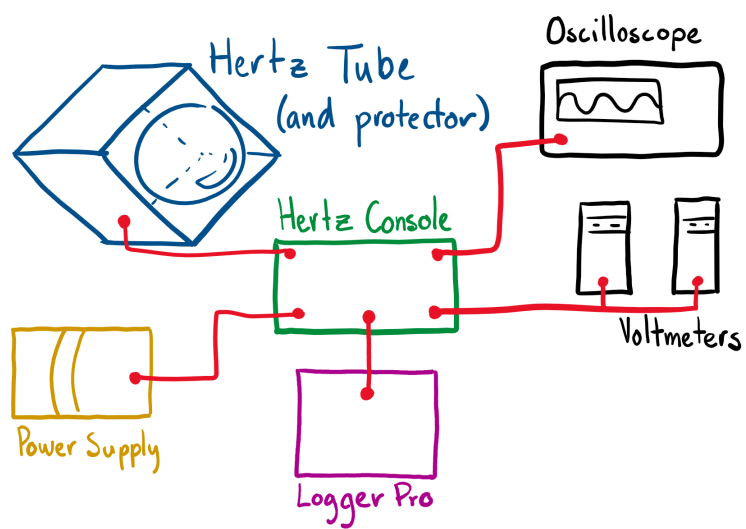


Figure 2.1: Schematic diagram of the experiment.

4. Data analysis

4.1 Distant Object

4.2 Mirror Method

4.3 Thin Lens (Imprecise)

4.4 Thin Lens and Magnification

4.5 Lensmaker