HOMEWORK #2: LENS EQUATION

ABEL GOMES

The lens equation allows us to determine the image location, size, orientation and type of image formed of objects when placed somewhere in front of a lens. Recall that there are converging and diverging lenses. To obtain such numerical information about the image, it is necessary to use the Lens Equation and the Magnification Equation. The lens equation expresses the relationship between the object distance (z), the image distance (z'), and the focal length (d), and is as follows:

$$\frac{1}{z} + \frac{1}{z'} = \frac{1}{d} \tag{1}$$

Further Reading:
`http://hyperphysics.phy-astr.gsu.edu/hbase/geoopt/lenseq.html`
`http://en.wikipedia.org/wiki/Lens_(optics)`
`http://www.physicsclassroom.com/class/refrn/u14l5f.cfm`

Exercise 1

After studying the geometry of the lens explained in the lecture notes (transparencies):

- Derive the lens equations from the triangle-based geometry in the x, y, and z directions.
- Derive the corresponding lens matrix.

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