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Invisibility

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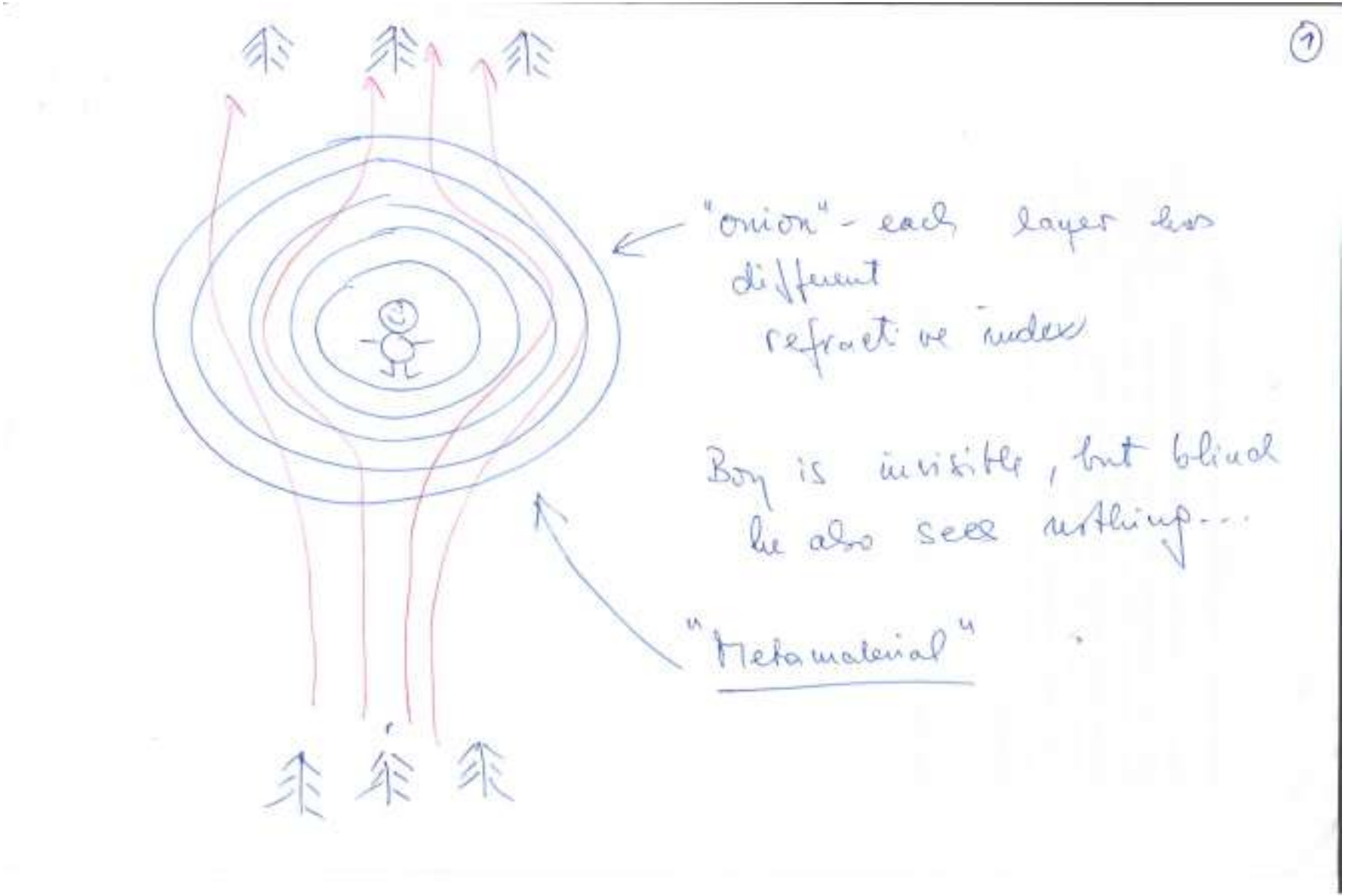
Invisibility

Lenticular lenses can be used to distort light and make objects disappear. Investigate how changing the properties of the lens and the geometry of the object affect the extent to which the object can be detected.

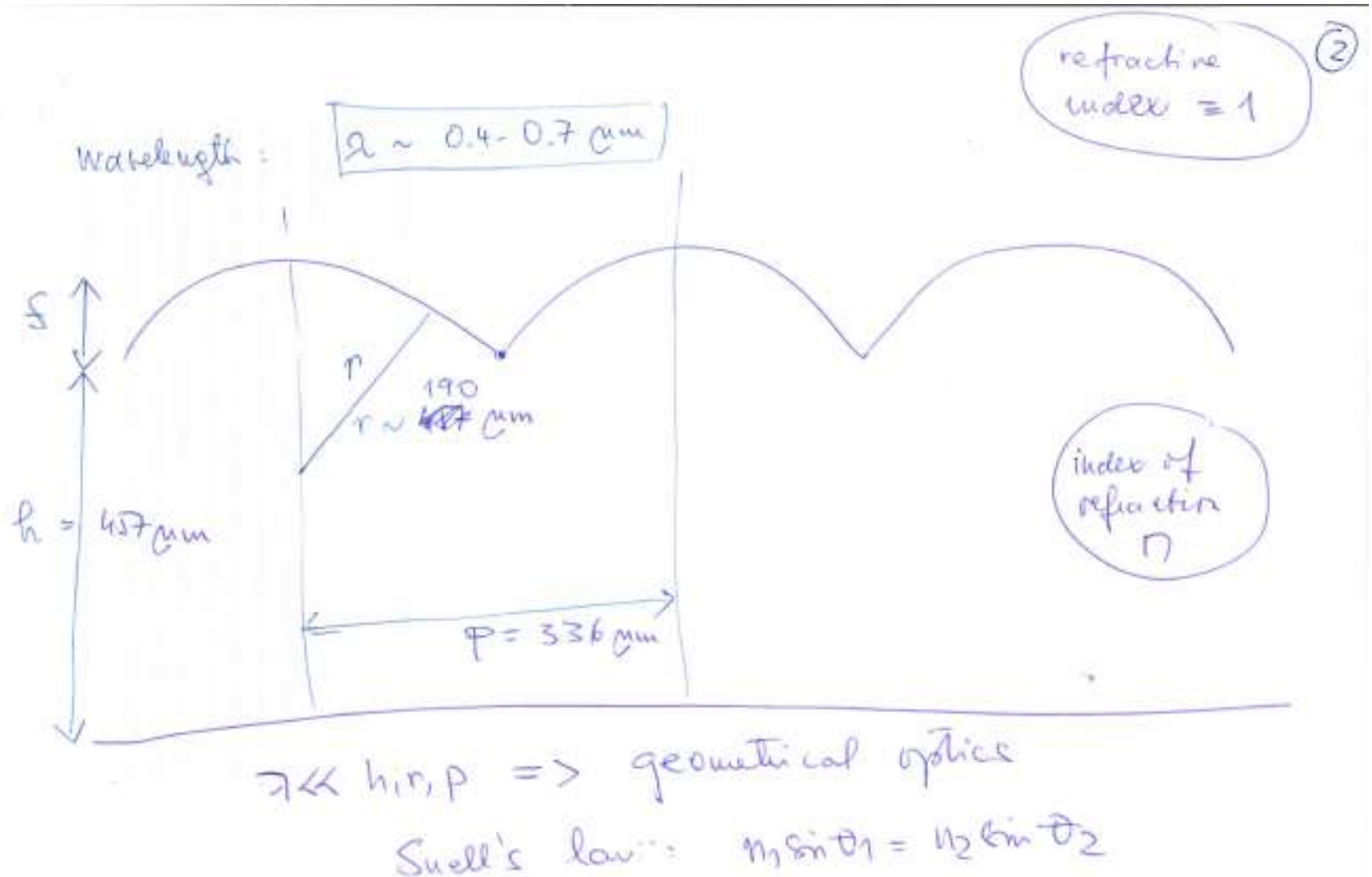
Lentikulárne šošovky sa dajú použiť na zakrivenie svetla a zmiznutie objektov. Preskúmajte, ako zmena vlastností šošovky a geometrie objektu ovplyvnia mieru, do ktorej je možné objekt pozorovať.

Invisibility

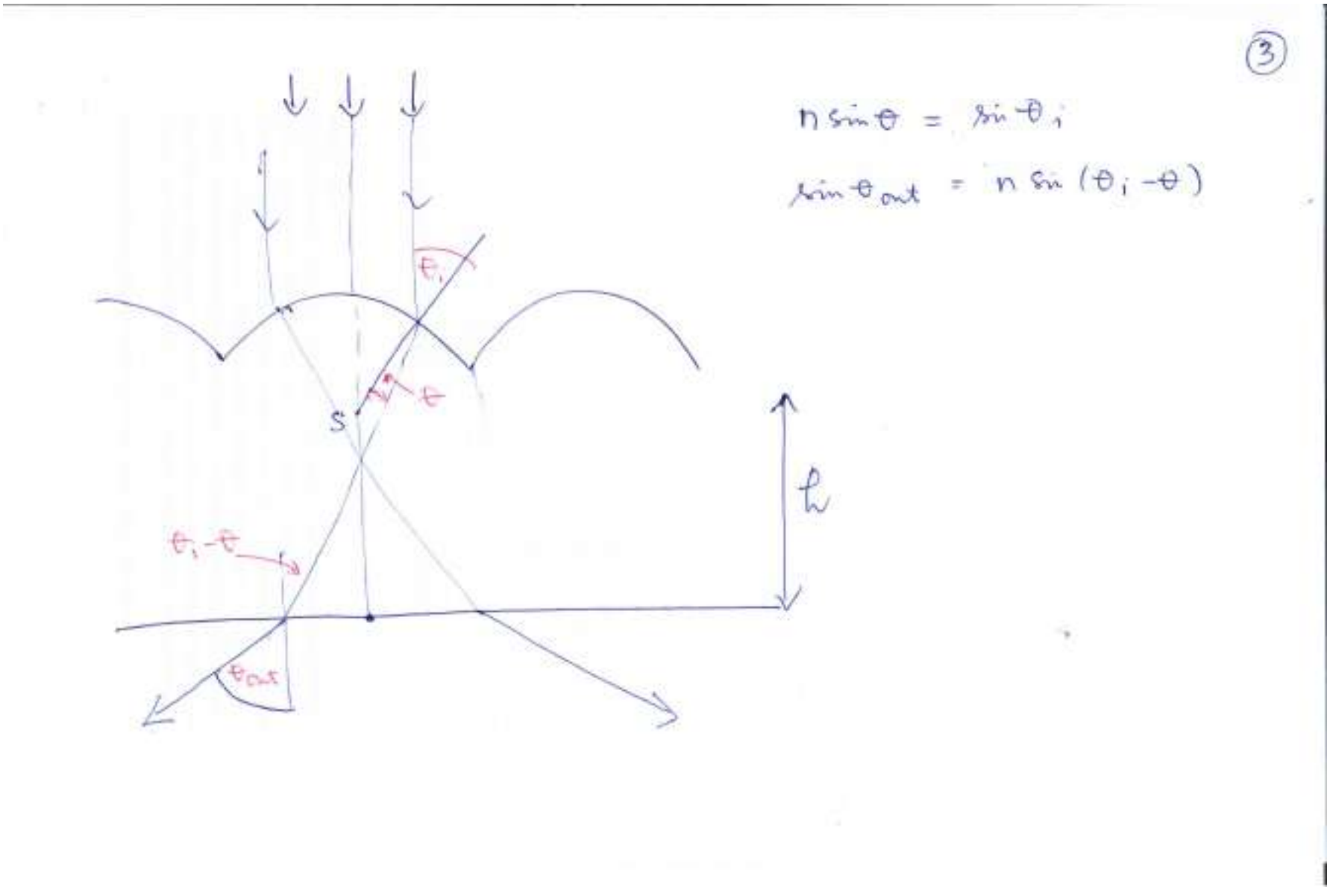
Do not miss with the invisibility described by Sit John Pendry (2000)



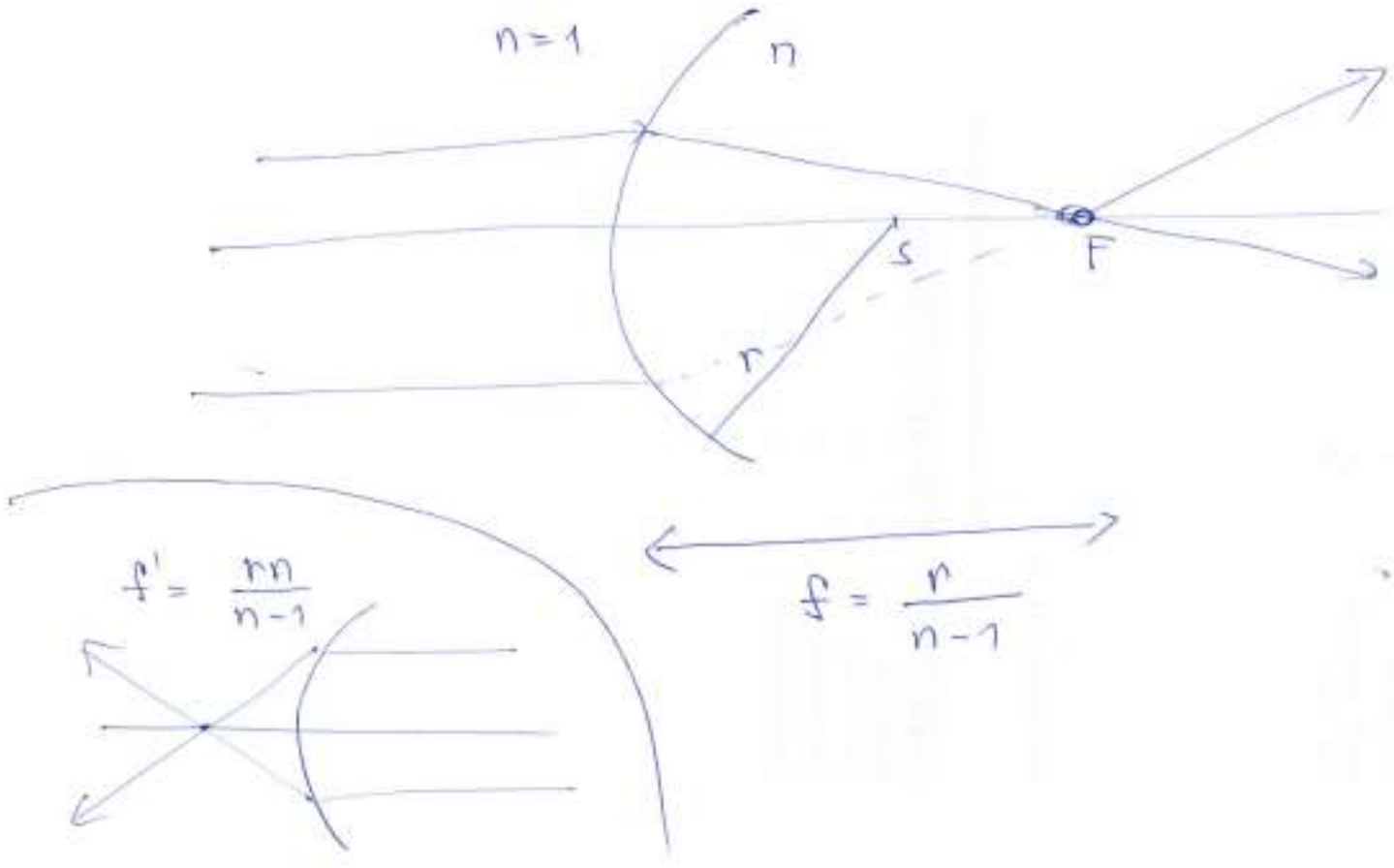
Lenticular lens - the geometry allows geometrical optics



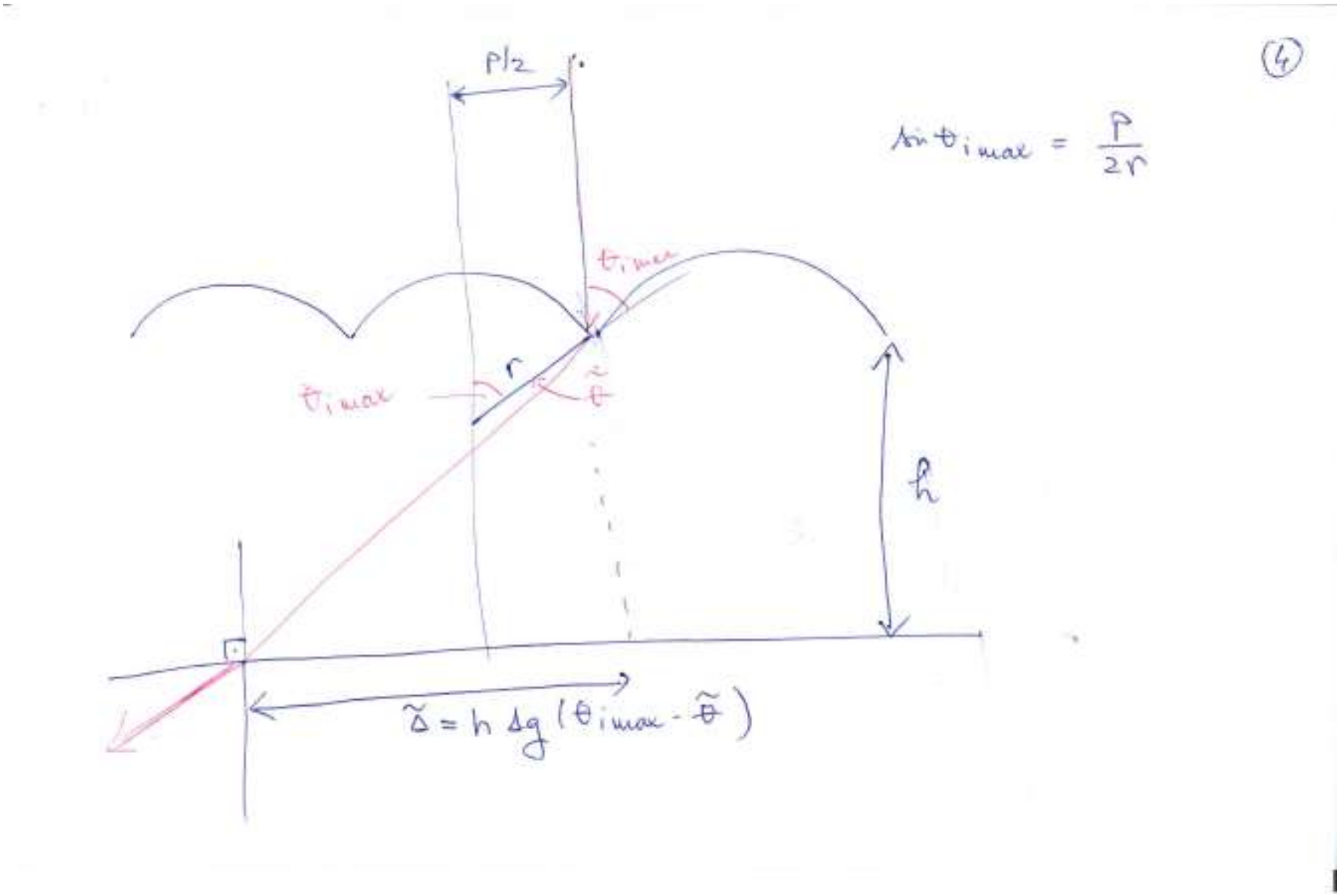
Propagation of light through lenticular lens 1



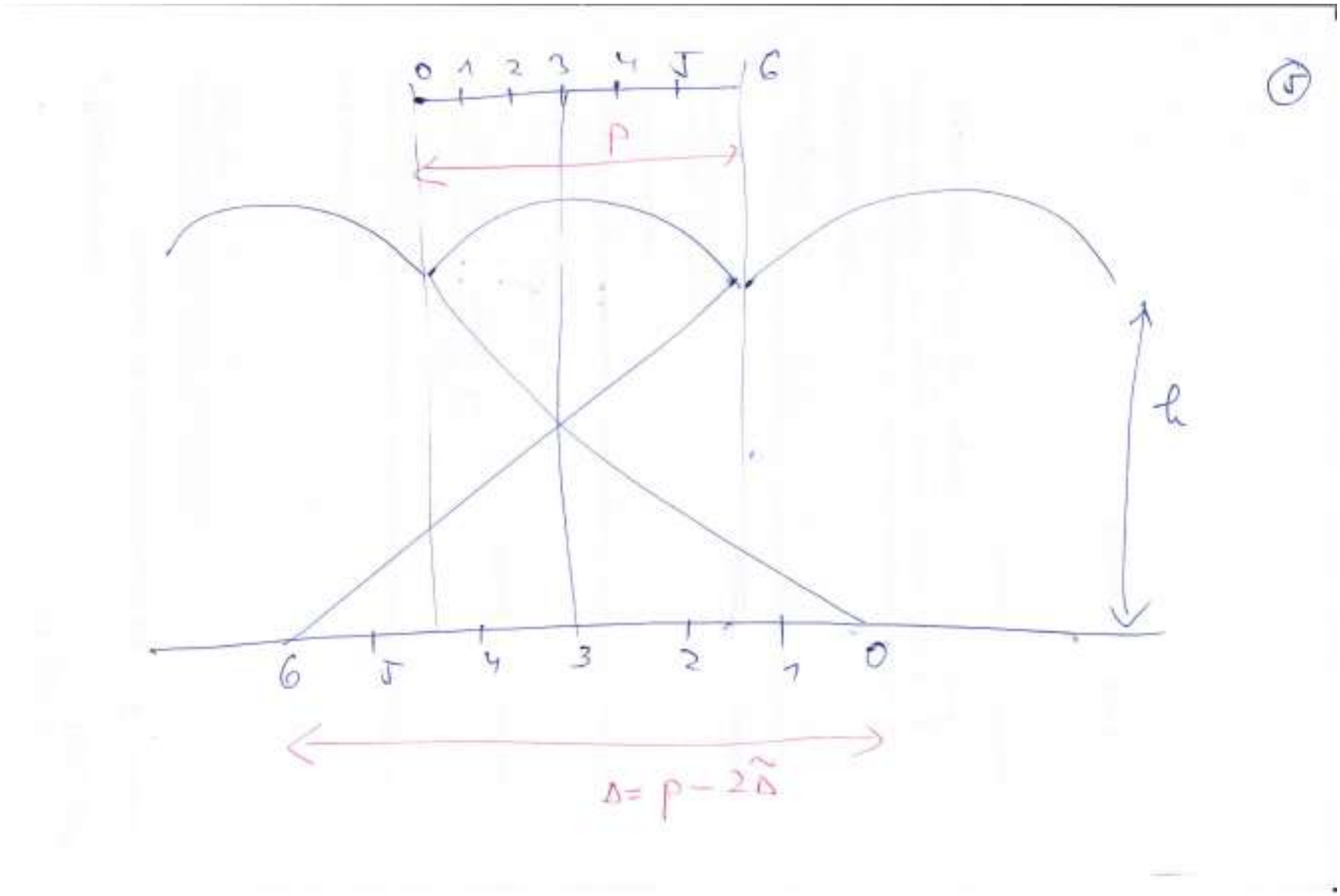
Focal length



Propagation of light through lenticular lens 2

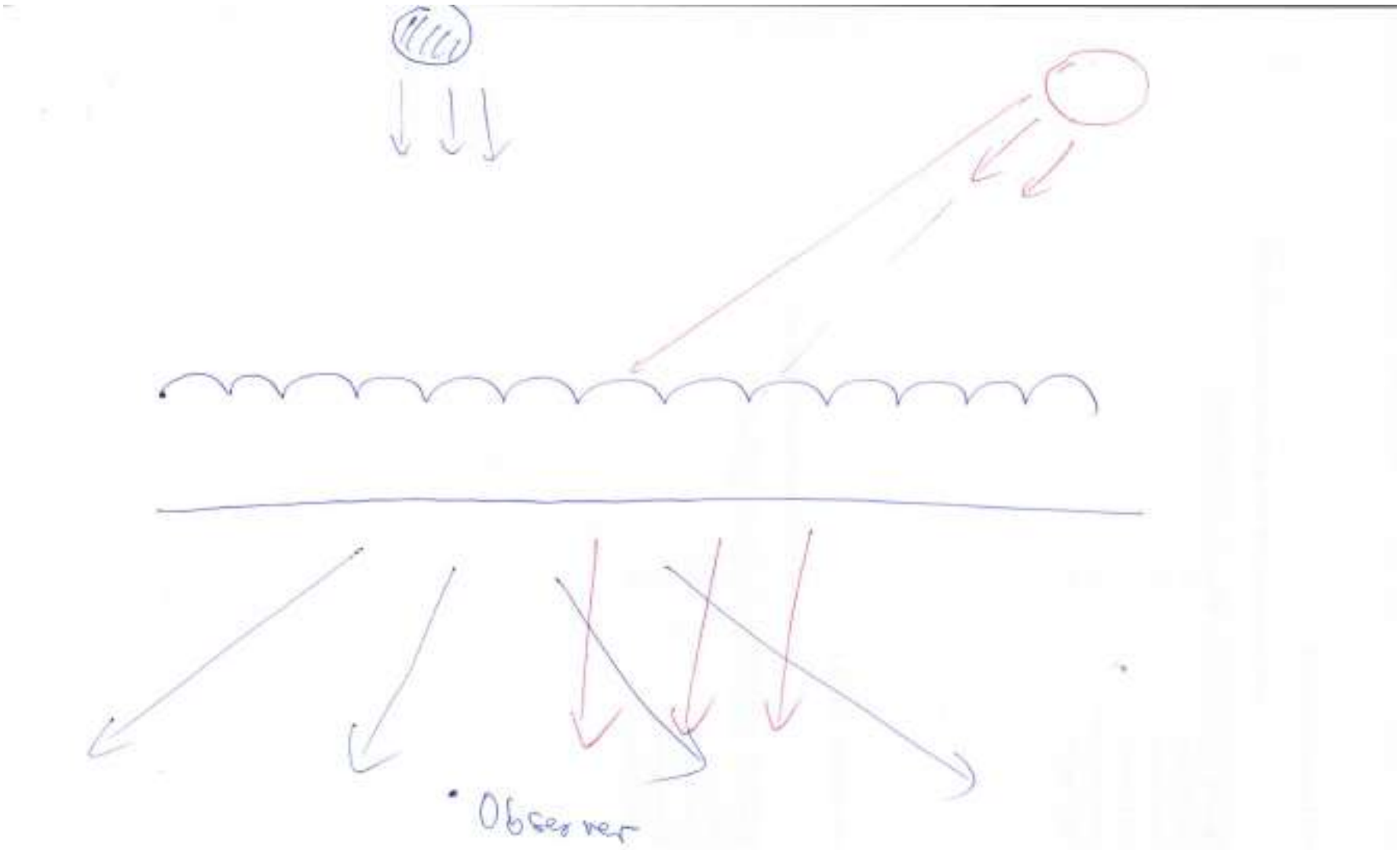


Propagation of light through lenticular lens 3



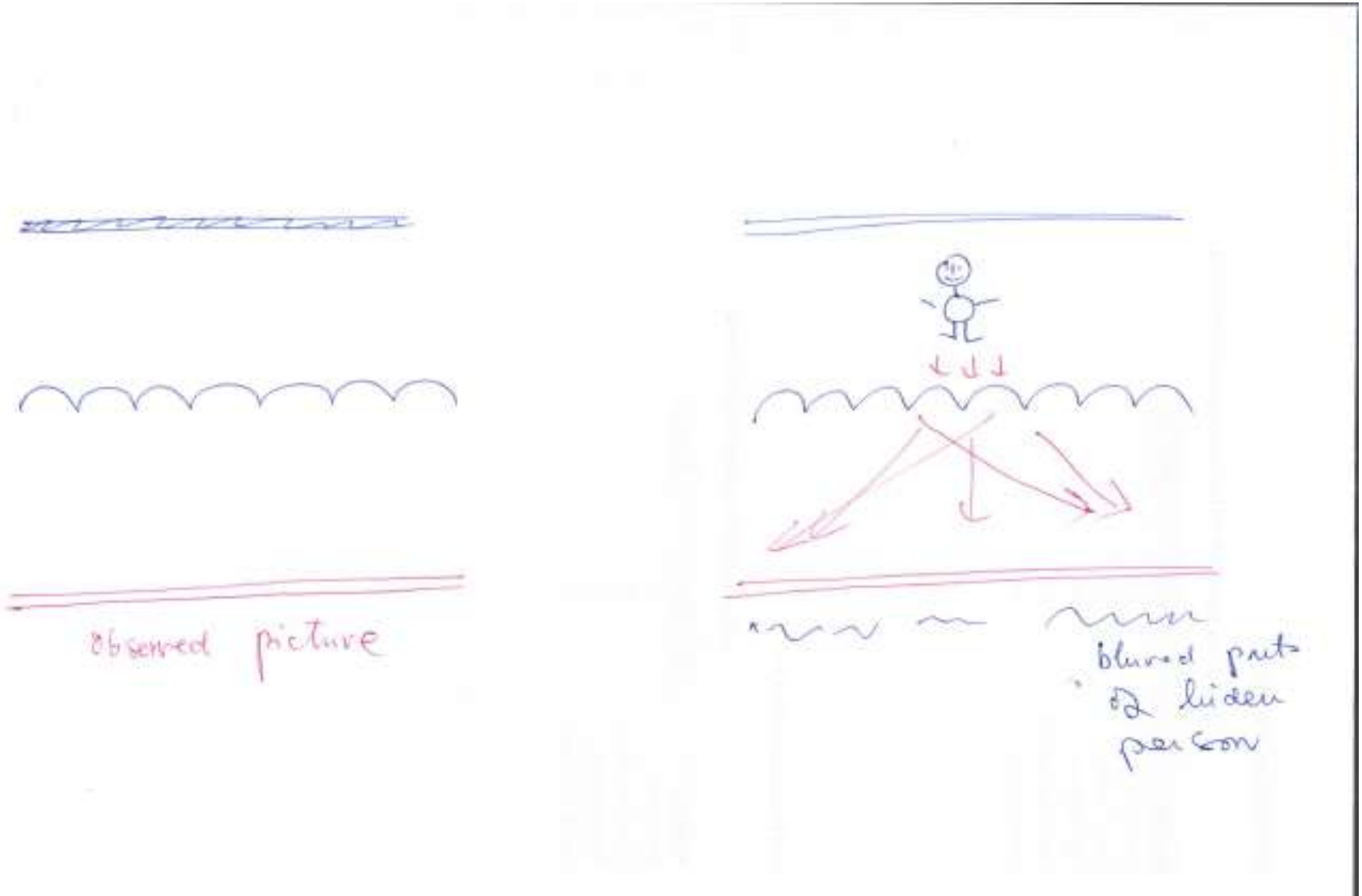
Observer

There is no invisibility; observer just does not see objects in front of him, but receives rays from objects located aside (right or left).

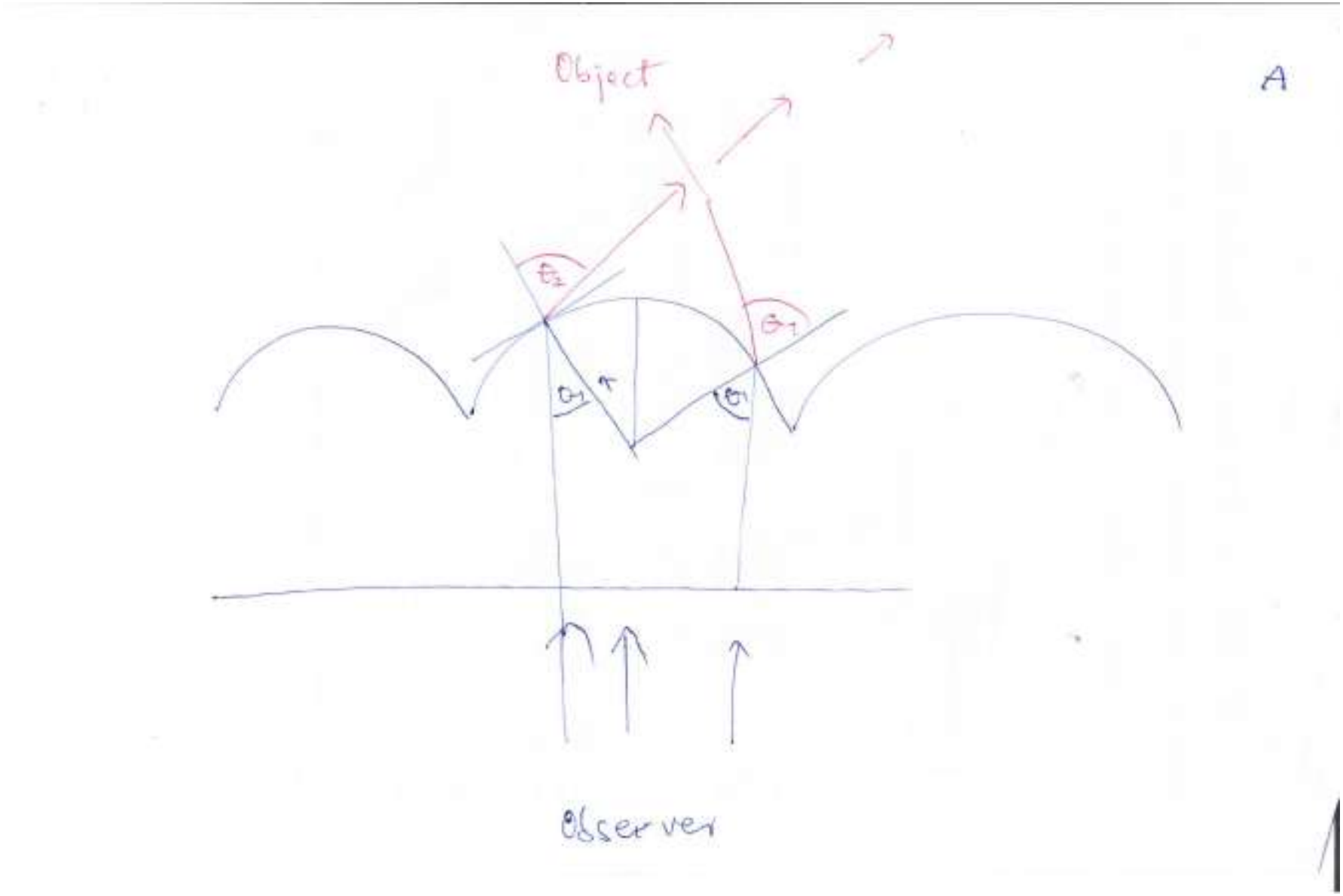


Illusion of invisibility

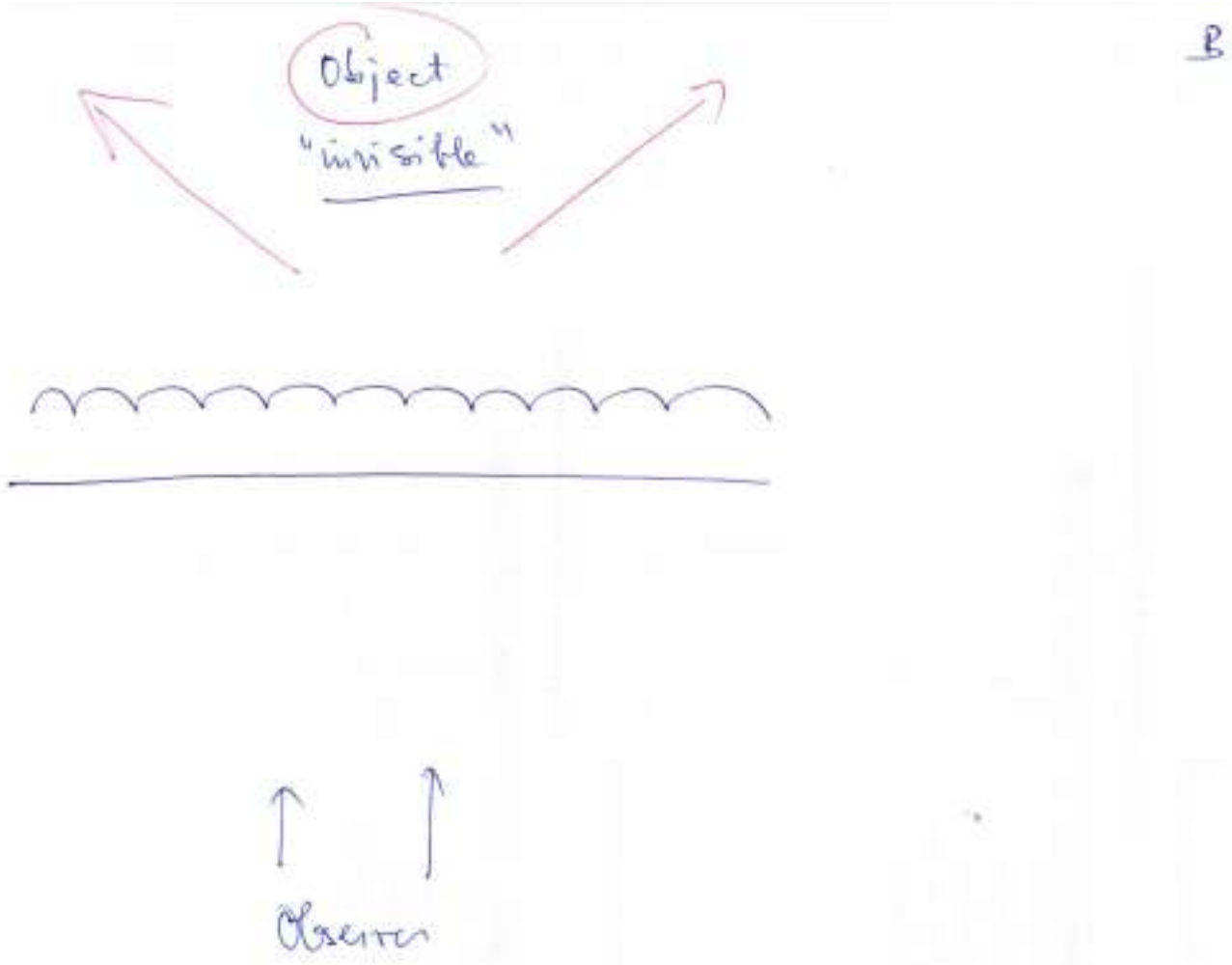
LL projects long horizontal line into long horizontal line, although the picture might be somehow blurred. It is why “invisible persons” usually stay in front of horizontal background.



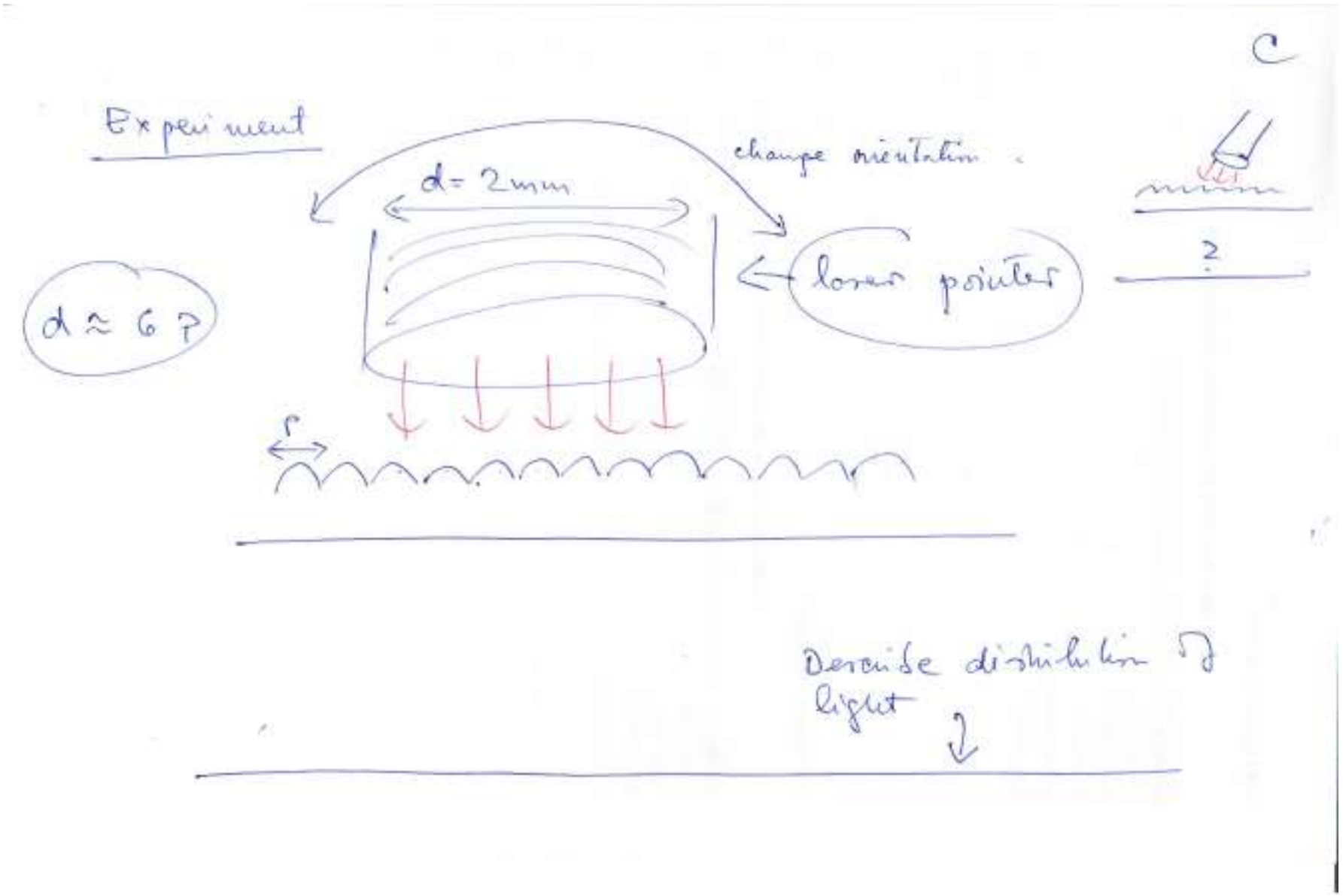
Observer 1



Observer 2



Experiment


C
Experiment
change orientation
d = 2mm
laser pointer
d ≈ 6 P
?
Describe distribution of light

Questions

- Does LL work also from the opposite side?
- How the “invisibility” depends on the distance of object/observer from LL ?
- Experiment with small laser / two lasers with different colors
- Simulation?
- Optimization of geometrical parameters? r, p, h ?