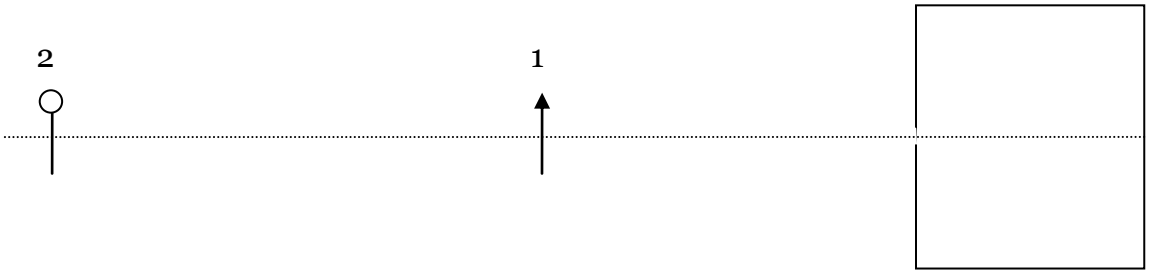
WS21 Camera

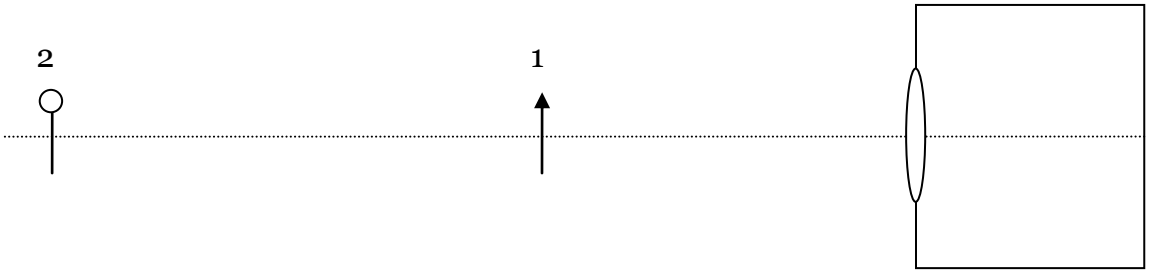
A pinhole camera is simply a box with a small aperture cut in it and a sensor (film, ccd camera) some distance away. Consider the following situation: a pin hole camera and two objects located different distances from the aperture. Determine what impact the distance has on the image of the two objects. Consider blur of the image – sketch what the image of each object would look like.



Are the two images equally in "focus"? Why is that?

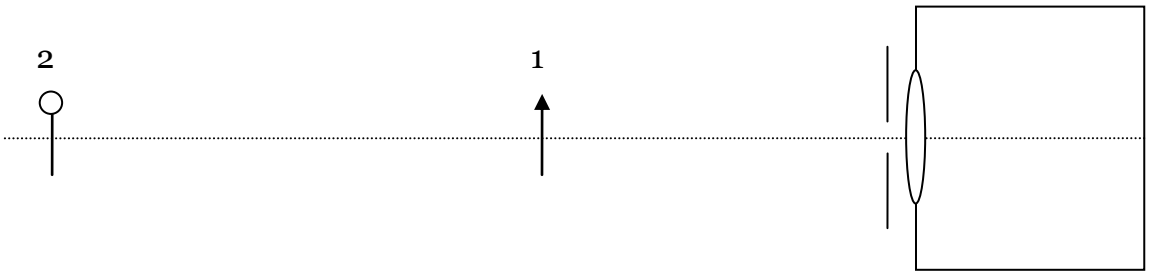
What determines the amount of blur in a pinhole camera?

The pinhole can be replaced with a converging lens. The image of object 1 is formed clearly on the back of the camera.



How will the image of object 2 appear? Sketch the image of object 2.

Suppose that you placed an aperture in front of the lens.



How would the aperture change the results of the image of object 2? Explain and sketch.

Depth of field corresponds to the range of distances from the camera which will still be "in focus". What is the depth of field for a pinhole camera? What role does the aperture play on the depth of field? What impact do you think aperture size would have on shutter speed? Explain your answers.

Suppose that you used a really short focal length lens, ~1cm and placed the "film" 1 cm from the lens. For each object, where would the image form? How blurry would these images be?