2. CELLPHONE CAMERA (6 points) A photographer focussed his camera to distance L and took a photo. On the photo, all farther objects (up to infinity) turned also out to be sharp. Additionally, all closer objects down to distance s were sharp.

i) *(4 points)* What is the minimum possible L?

ii) *(2 points)* Find the corresponding s.

Background. We consider the image of a pointlike object to be sharp if its image is smaller than one pixel on the sensor. Otherwise the image is blurry. The lens of the camera may be viewed as a convex lens. The camera is focussed by changing the distance between the sensor and the lens.

Parameters. Calculate the answer for a cellphone made by a well-known company. The focal length of its camera $f = 4.3\,\text{mm}$ and the diameter of the lens $D = 1.8\,\text{mm}$. The sensor is $w = 4.6\,\text{mm}$ wide corresponding to $N = 3264$ pixels.