Problem 1

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1. Refer to figure 1. A CCD camera chip of dimensions 7 × 7 mm, and having 1024 × 1024 elements is focused on a square, flat area, located 0.5 m away. How many line pairs per mm will this camera be able to resolve? The camera is equipped with a 35-mm lens.

2. Download the image processing tutorial (the user's guide) from Mathworks (http://www.mathworks.com/access/helpdesk/help/toolbox/images/), read the tutorial and make practice according to the tutorials. (If the website is not accessible, 5 practices from the tutorial are given as PDF files).

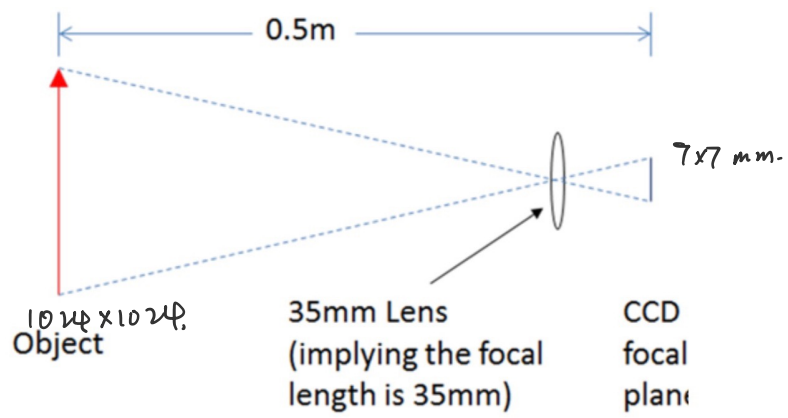

Figure 1

Solutions:

$\frac{35mm}{7mm} = \frac{0.5m}{x}$　　$x = 0.1m = 100mm$.

In each milimeter, we have $\frac{1024}{100mm} = 10.24 \approx 10$ elements

the line pairs : $\frac{10}{2} = 5$.　　The answer is 5 line pairs / mm