Questions

1) Figure 1 shows the Hough transform of a circle. Write the Cartesian equation of the circle. Write “$R$” for the radius if it is not possible to obtain its numerical value.

2) Write the equation for point (4,3) in the $(m,b)$ Hough space.

3) Write the equation for point (4,3) in the Hough space.

4) Figure 2-left shows the Hough transform of a line. Write the Cartesian equation of the line.

5) Figure 2-right shows the Hough transform of a line. Write the Cartesian equation of the line.

6) Consider the images of figure 3, the optical flow is shown in (check the correct answer)
   a) the image of figure 4 top left
   b) the image of figure 4 top right
   c) the image of figure 4 bottom left
   d) the image of figure 4 bottom right

7) We want to use the minimum distance classifier to solve for a simple classification problem. The data is summarized in table 1. Because we are using three features, the decision function is plane. Find the equation of the plane.

<table>
<thead>
<tr>
<th>Class $K_1$</th>
<th>Feature 1</th>
<th>Feature 2</th>
<th>Feature 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class $K_2$</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

(1)
Fig. 2. Optical flow

Fig. 3. Two images taken at times $k$ and $k+1$
Fig. 4. Optical flow