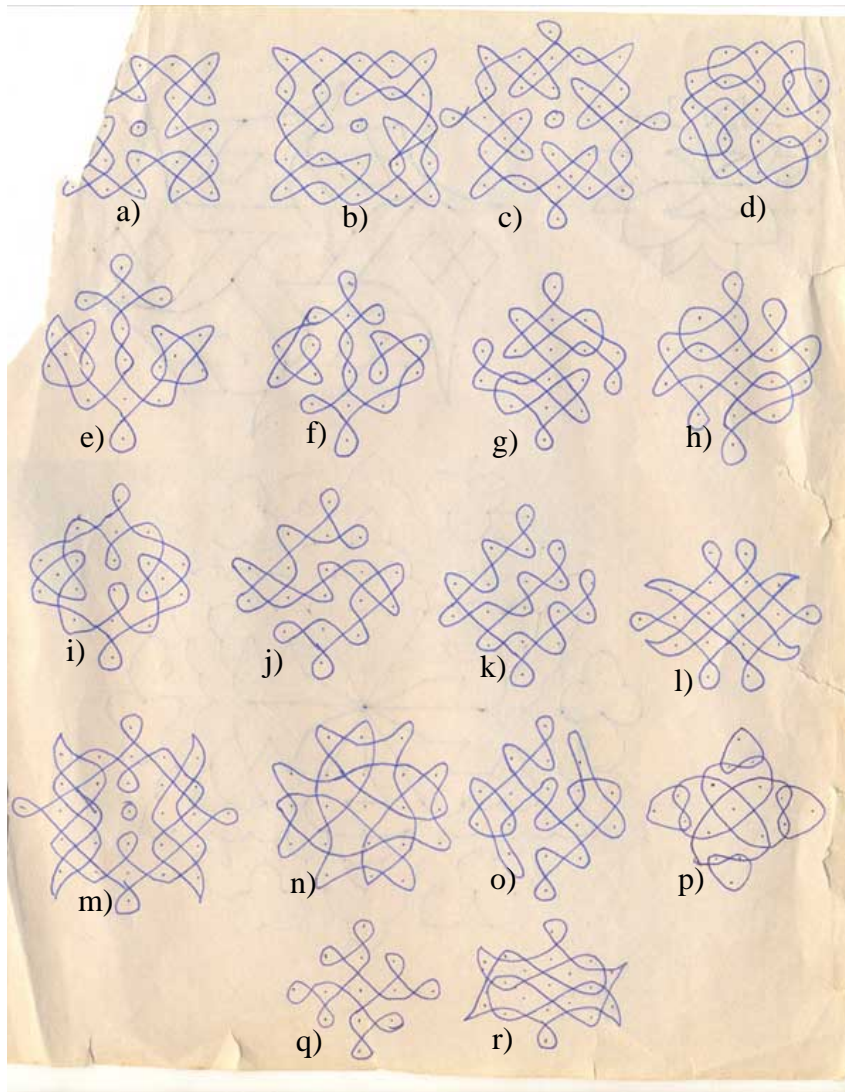


Consider the Kolam patterns in the following illustration:

http://www.lokvani.com/lokvani/a_images/y2007/3856n.jpg



The E-magazine states that “To the best of our knowledge the pictures and animations on lokvani are not copyrighted!” The illustration is included beside the article:

http://www.lokvani.com/lokvani/article.php?article_id=3856

1. Which patterns have i) vertical or ii) horizontal reflections or iii) no reflections?
2. Which patterns have rotational symmetry? What is the largest order of rotation in each?
3. Which, if any, of the patterns have no rotational symmetry?
4. Using a five by five dot pattern (yes, it is slightly different from the one used in these drawings) draw your own Kolam pattern and identify the symmetries.