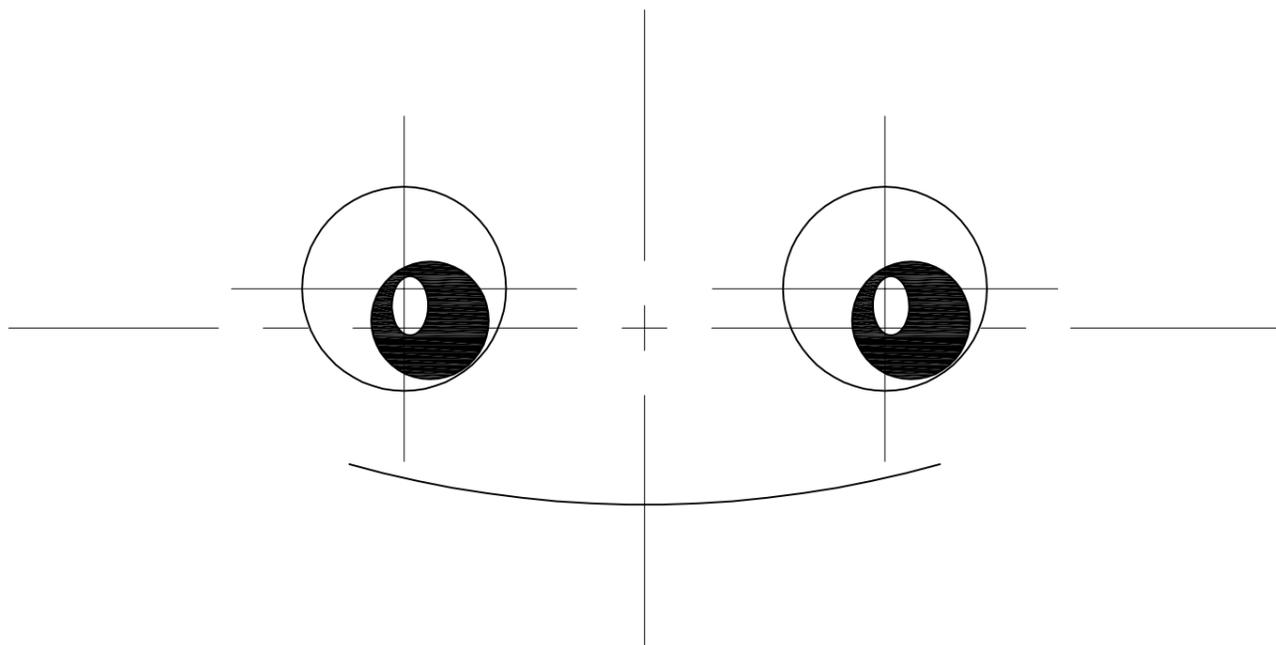
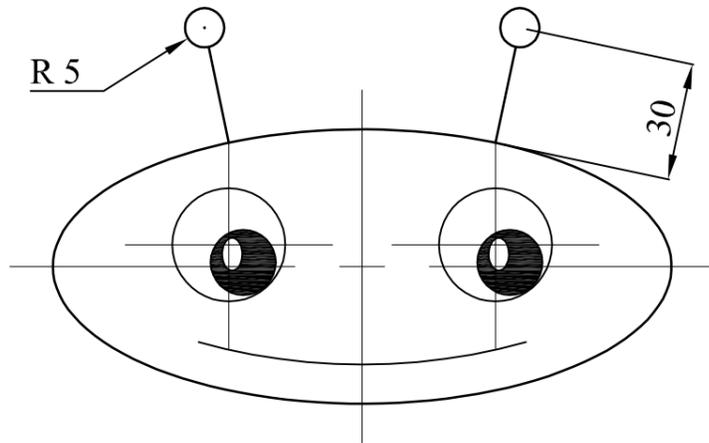


QUESTION No. 1

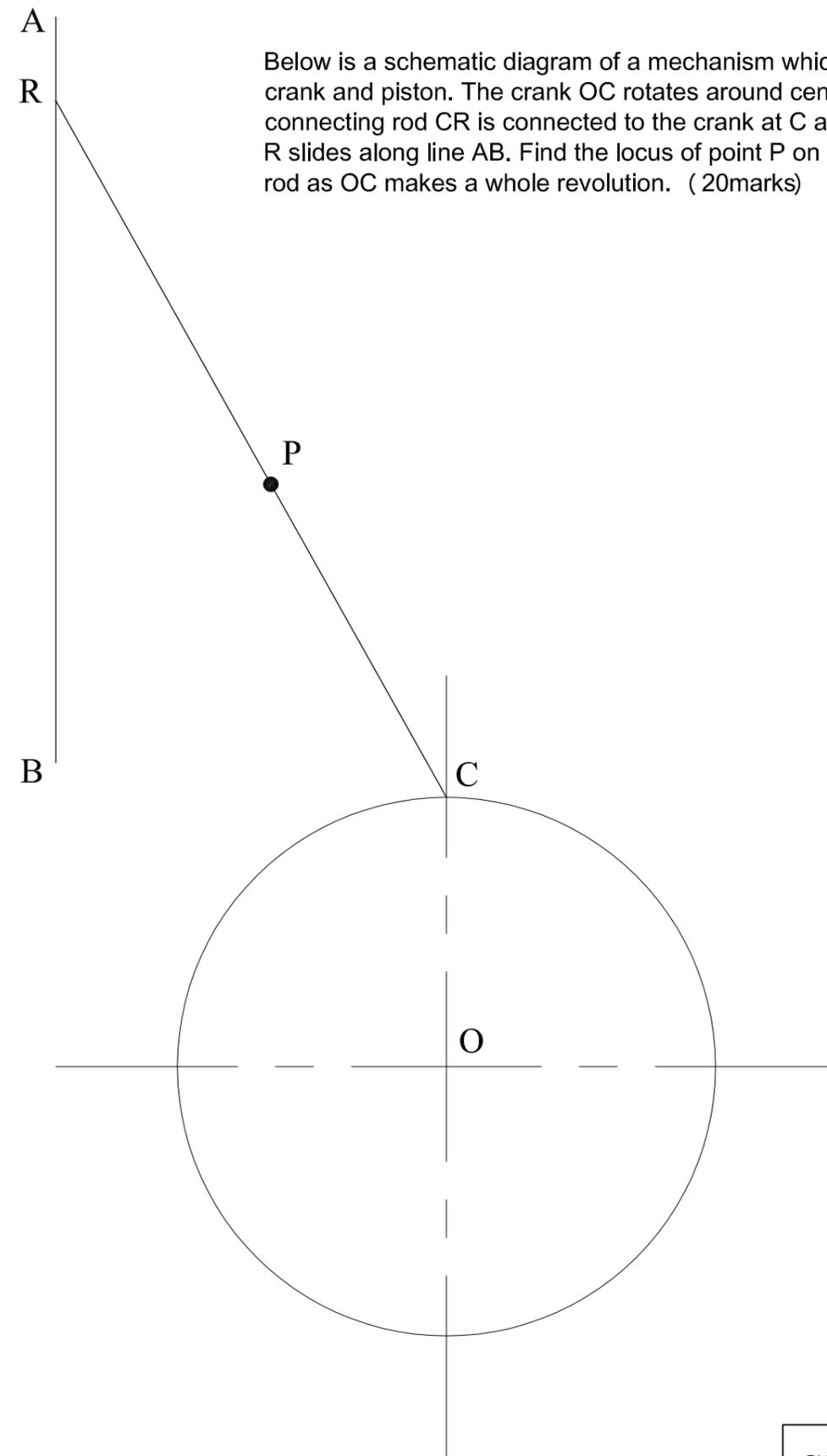
The logo of a toys company is made up of an alien face as shown in the diagram. On the centre lines provided construct:

- The ellipse that defines the outline of the face, using any method except trammel. The major axis is 158mm and the minor axis is 70mm. (8marks)
- The antennae which are normals to the ellipse. (7marks)



QUESTION No. 2

Below is a schematic diagram of a mechanism which is similar to a crank and piston. The crank OC rotates around centre O. The connecting rod CR is connected to the crank at C and its other end R slides along line AB. Find the locus of point P on the connecting rod as OC makes a whole revolution. (20marks)



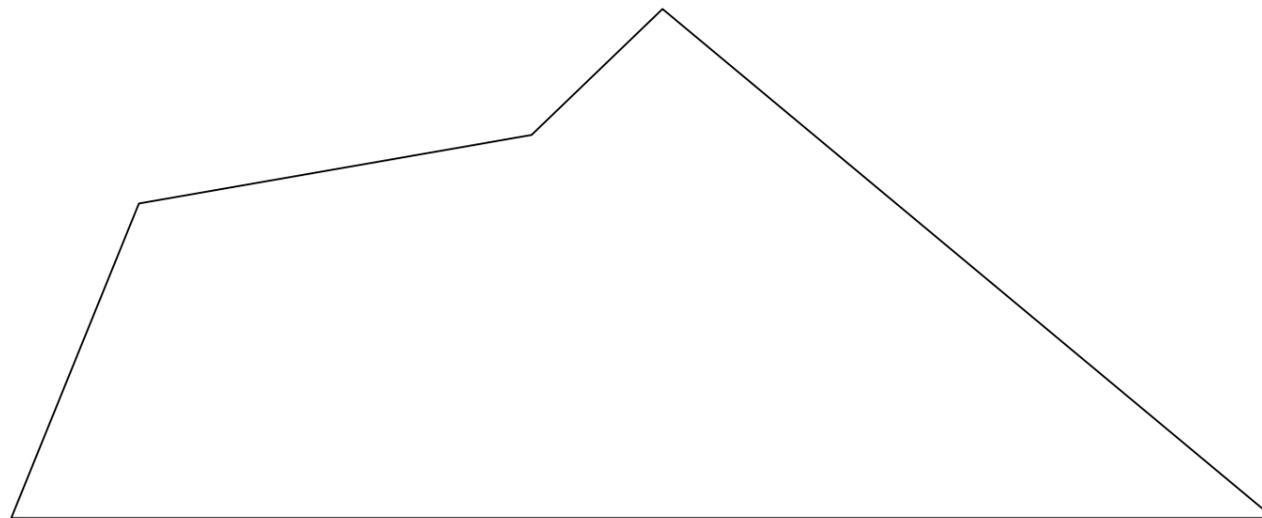
QUESTION No. 3

On the given centre lines, draw $1\frac{1}{3}$ turns of a double start helix that has a diameter of 80mm and a pitch of 150mm.

(20marks)

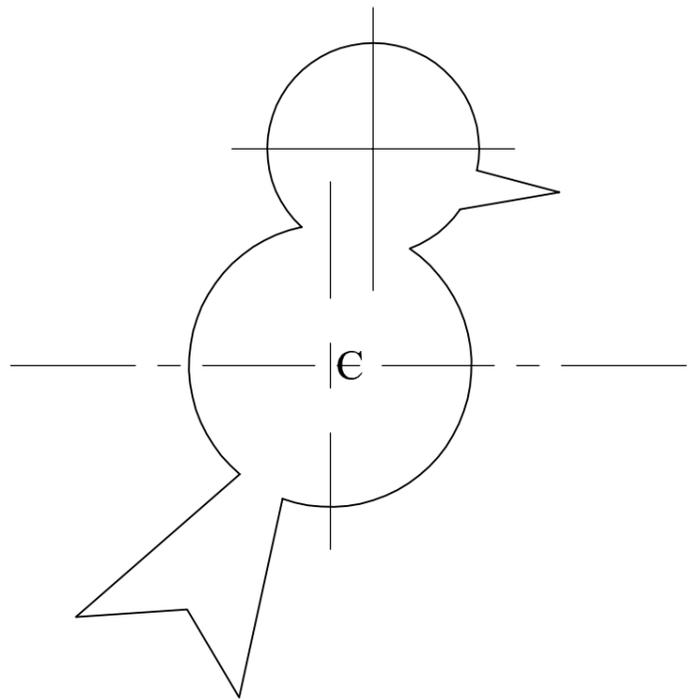
QUESTION No. 4

Convert the given irregular polygon into a square of the same area. (15marks)



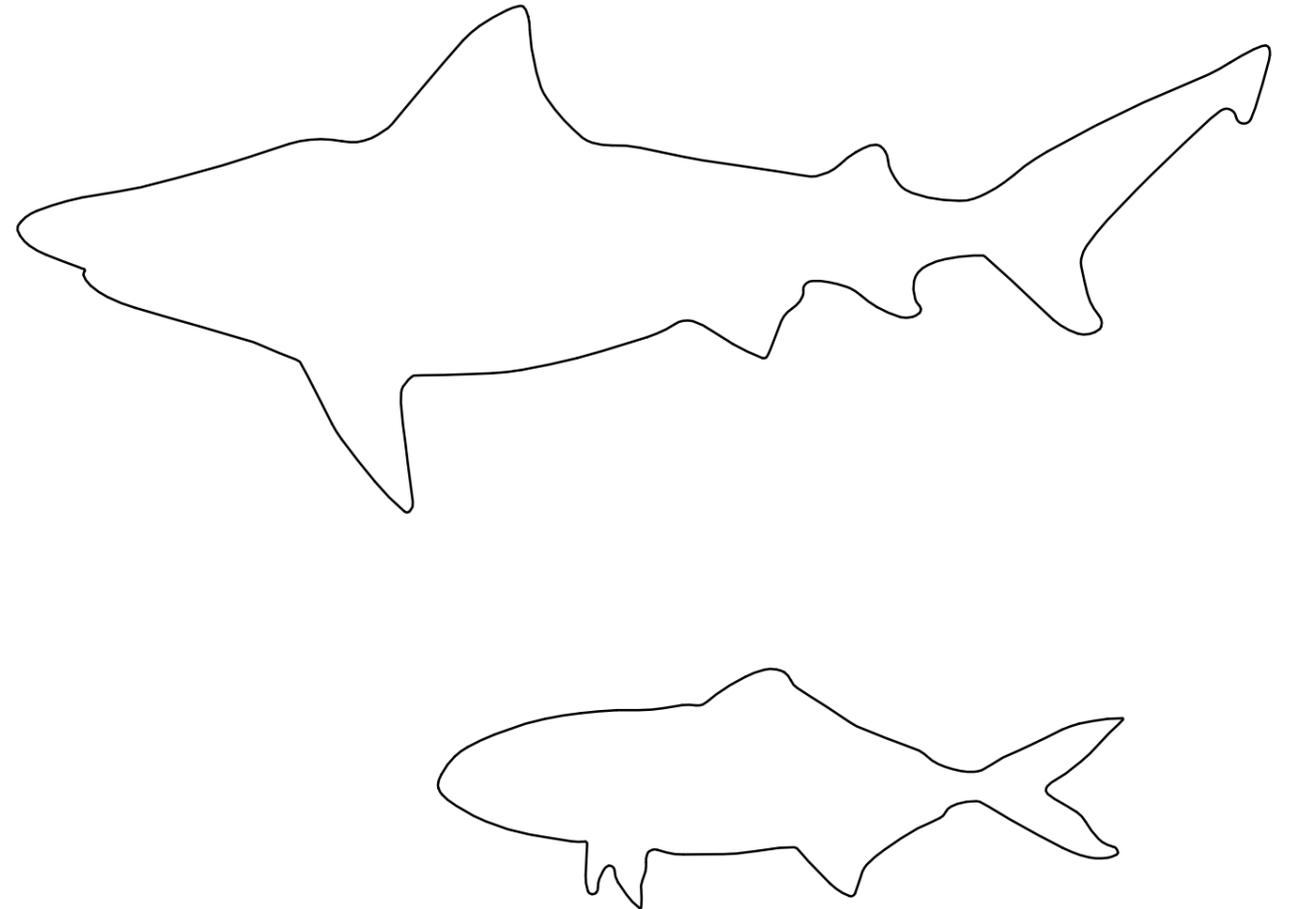
QUESTION No. 5

The diagram shows a cartoon outline of a bird. A kindergarten school teacher would like to use this diagram to make a poster for her classroom but she would like it to be twice the size it is. Enlarge the diagram to a scale of 2:1 so that the teacher can use it. (16marks)
Note: Use point C as the centre of enlargement.



QUESTION No. 6

A Bull Shark (top) and a Pilot fish (bottom) are swimming along the radar of a submarine. Find approximately by using the mid ordinate method, the area of the shark. (8marks) Use the counting squares method to find the area of the pilot fish. (6marks)



Area of Shark: _____

Area of Pilot fish: _____

