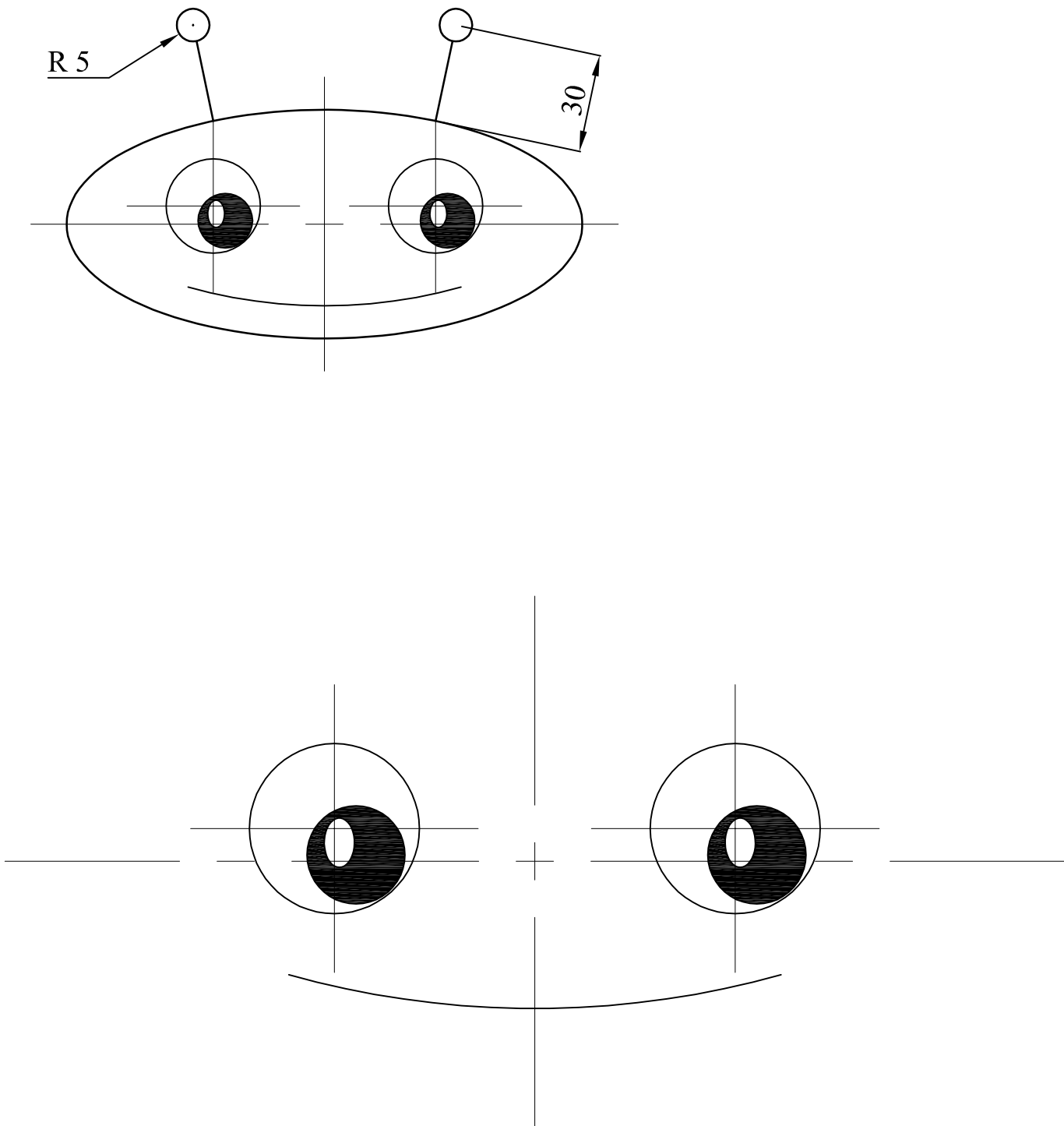


QUESTION No. 1

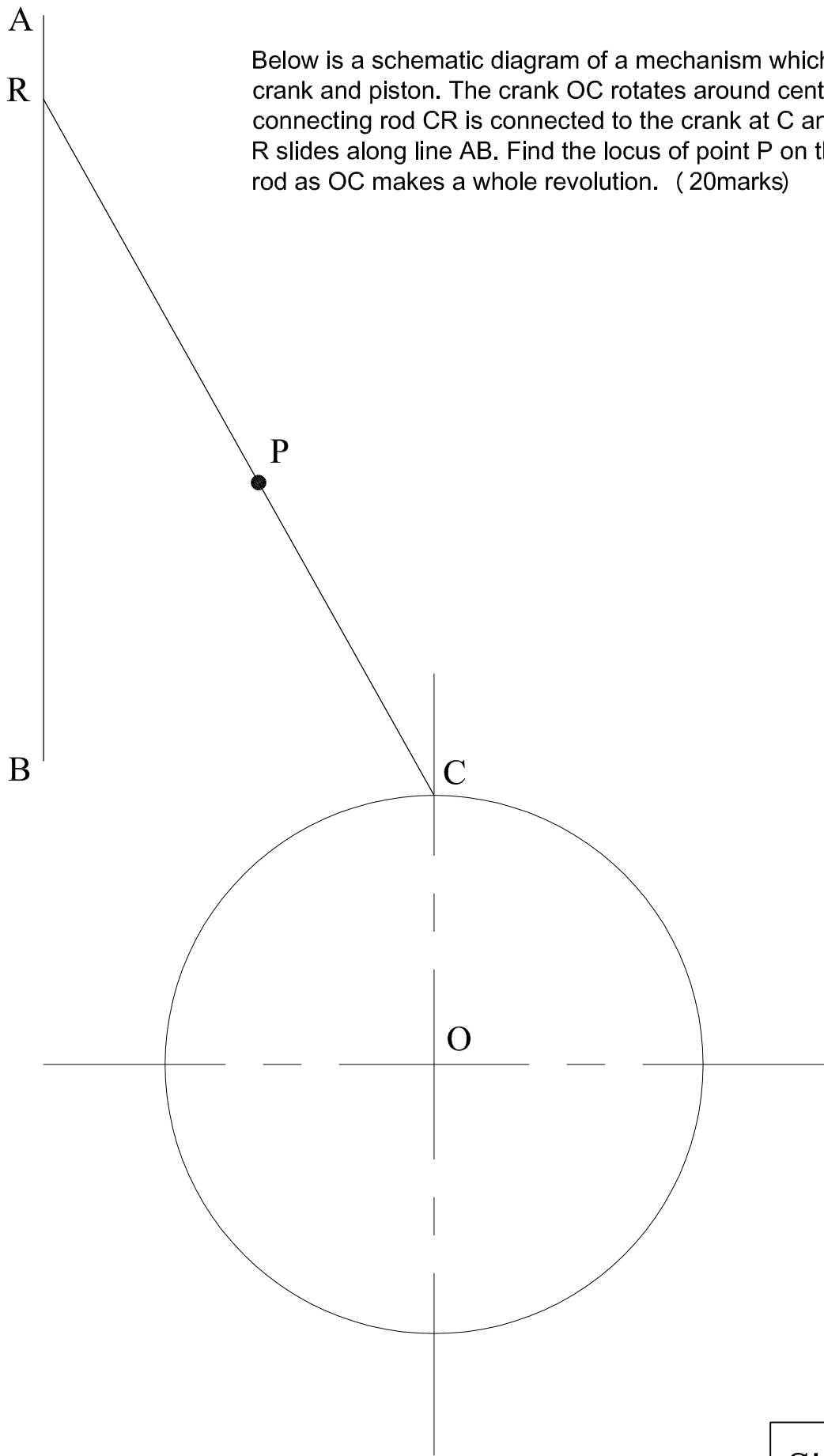
The logo of a toys company is made up of an alien face as shown in the diagram. On the centre lines provided construct:

- a) 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)
- b) 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

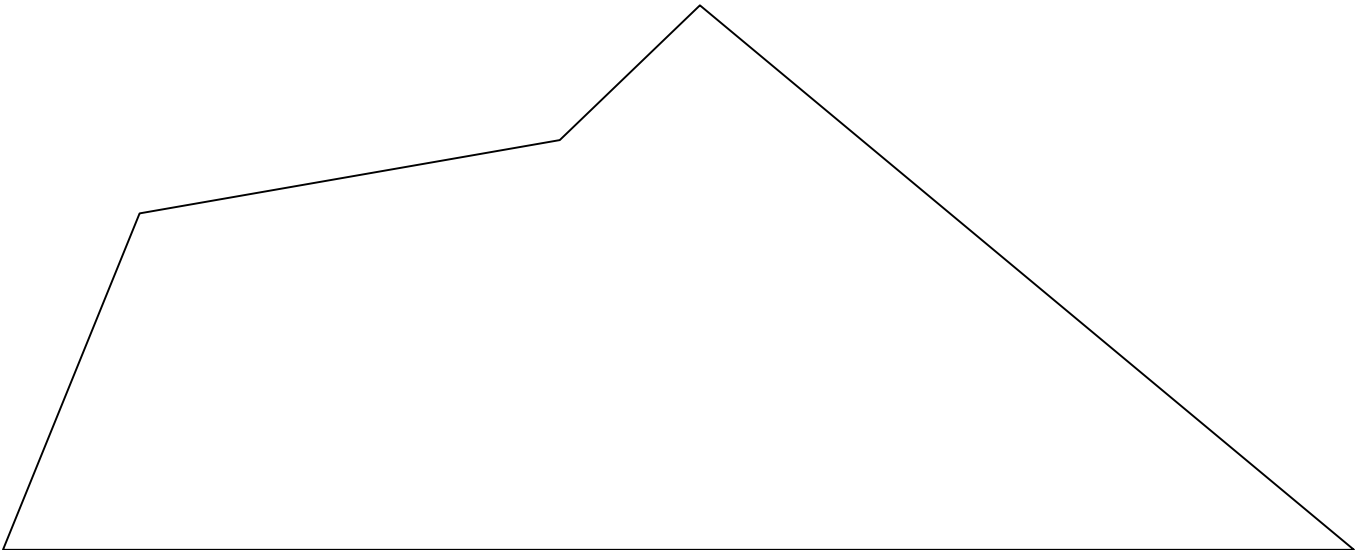
On the given centre lines, draw  $1\frac{1}{3}$  turns of a double start helix that has a diameter of 80mm and a pitch of 150mm.

( 20marks)



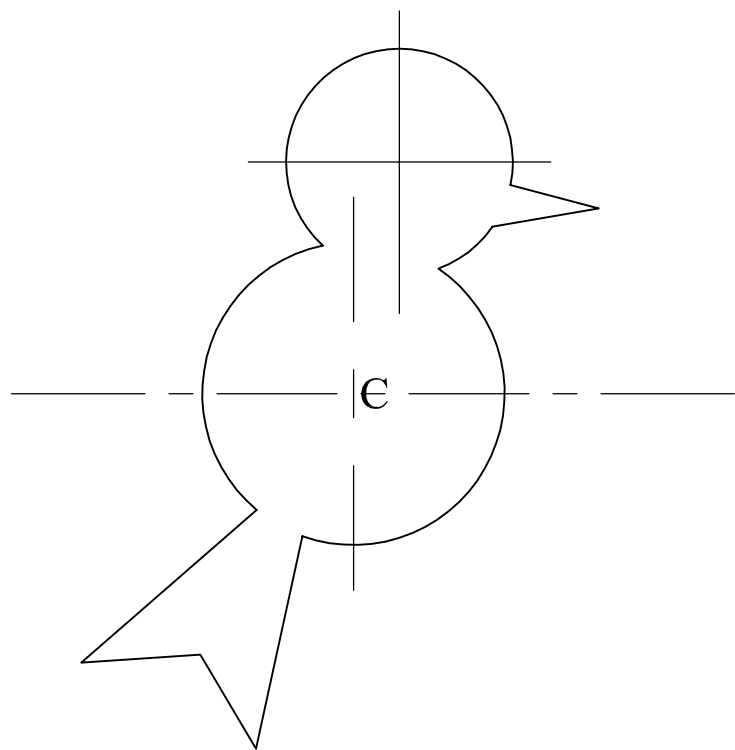
QUESTION No. 4

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



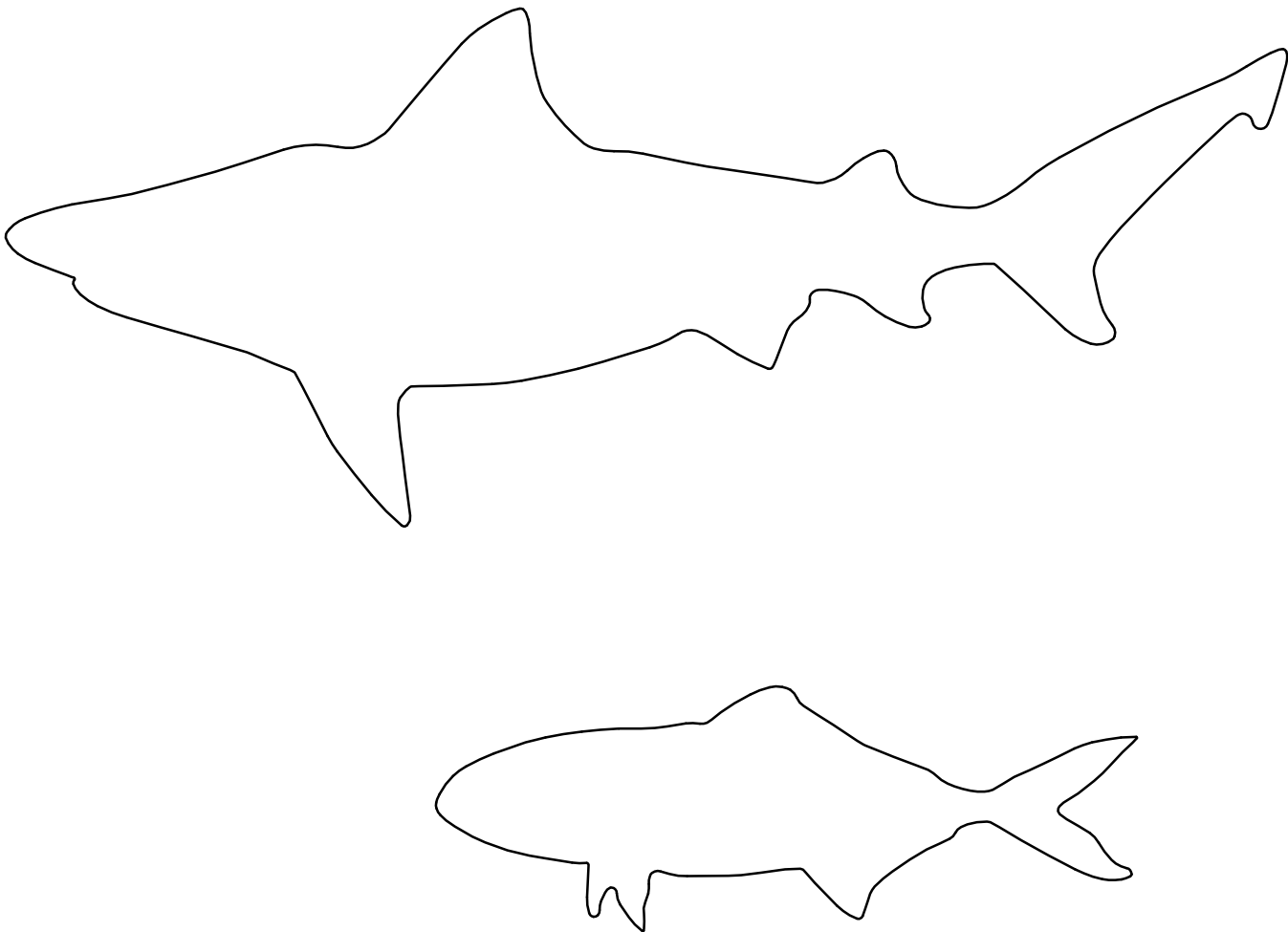
QUESTION No. 5

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: \_\_\_\_\_

