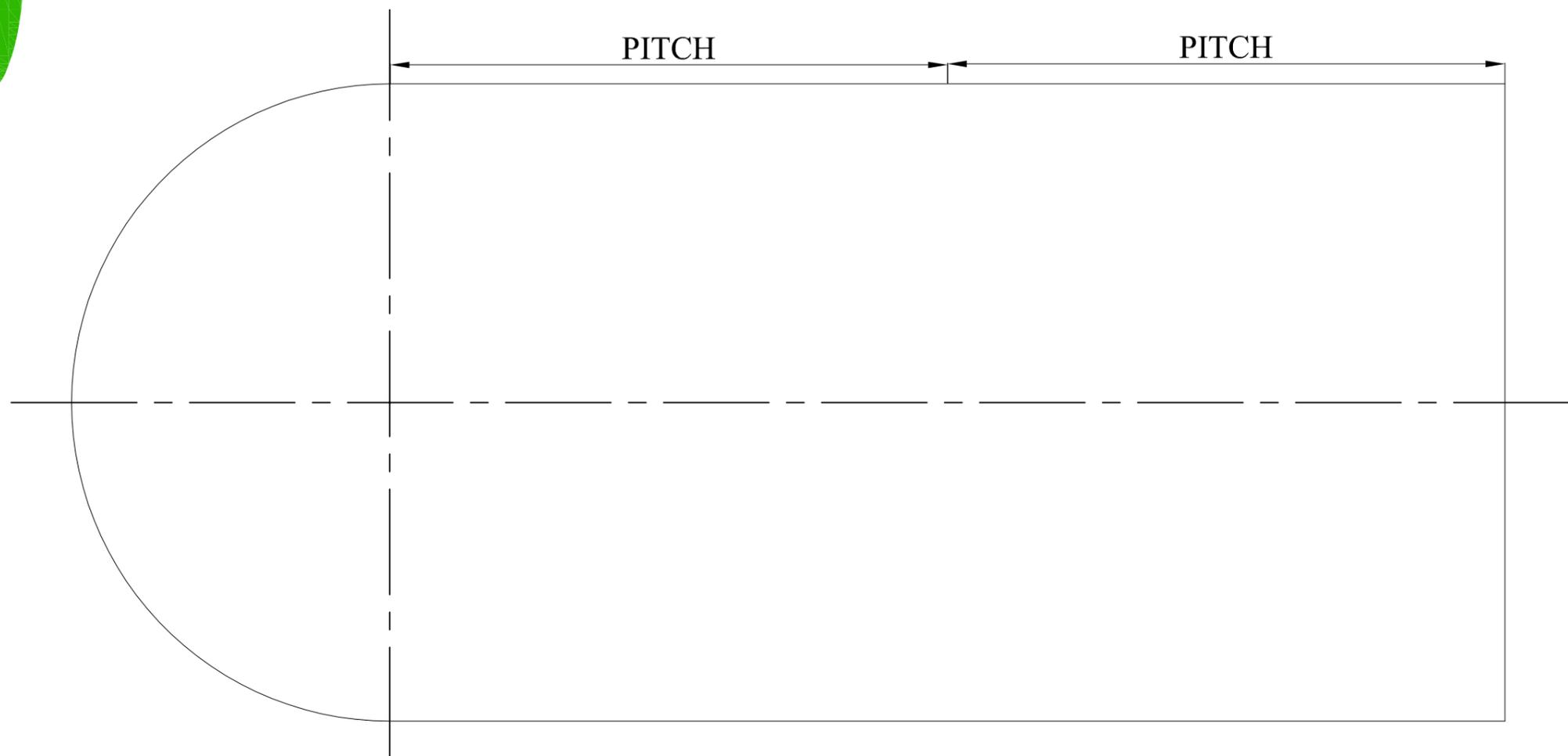
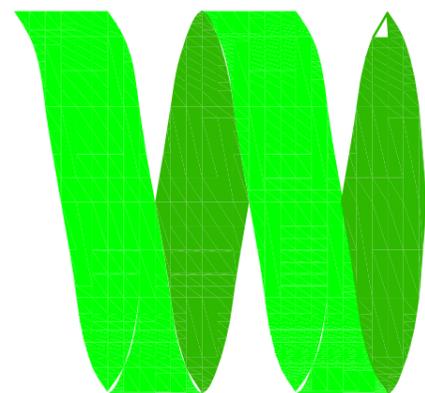
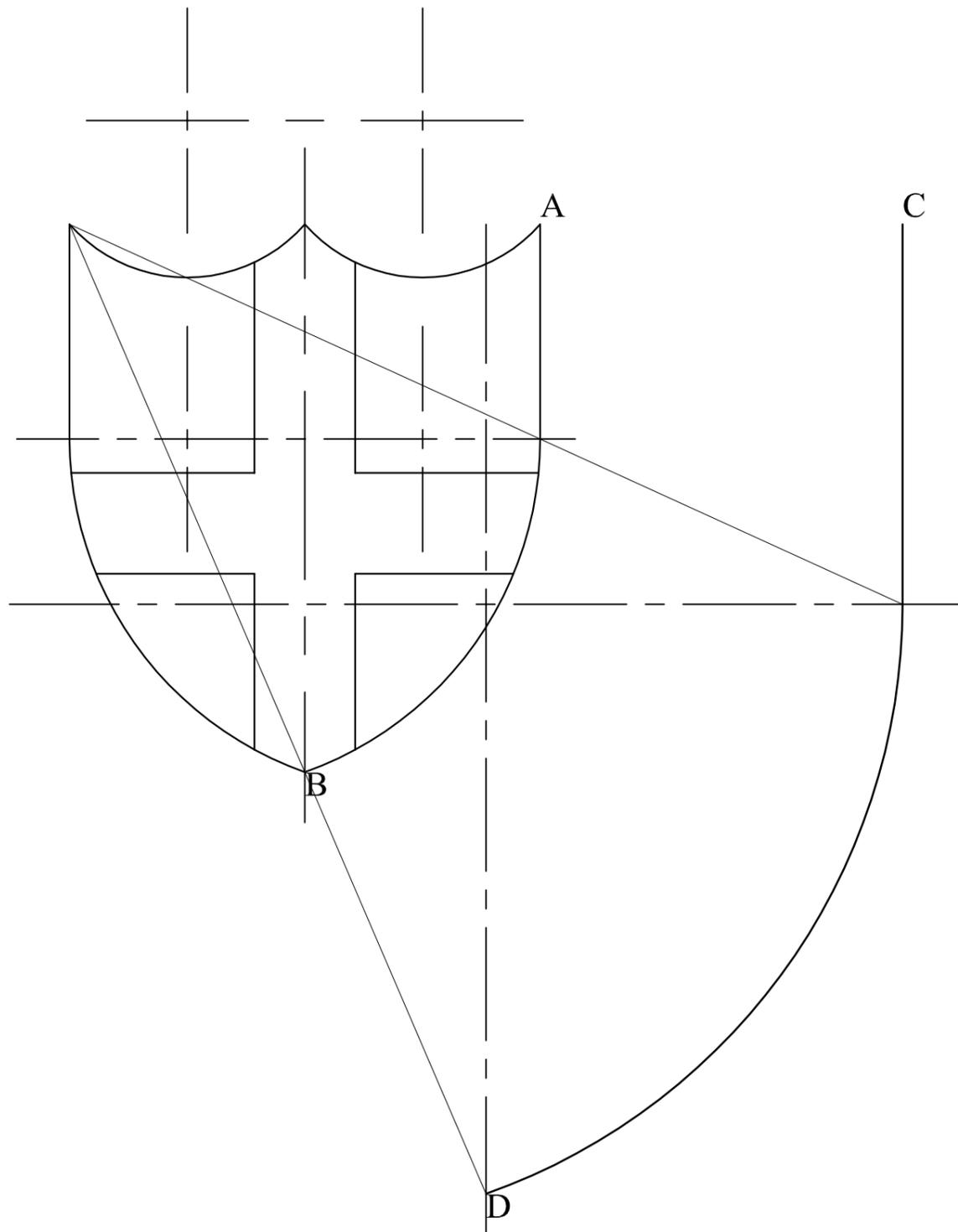


1. The figure below shows a **Right Hand Helical Band** formed by two simple helices. Using the diameter and pitch as shown draw the HELICAL BAND on the **marked two pitch lengths** given that the **thickness of the band equals half pitch**. Give colour to the helical band to show that it is a right hand band.

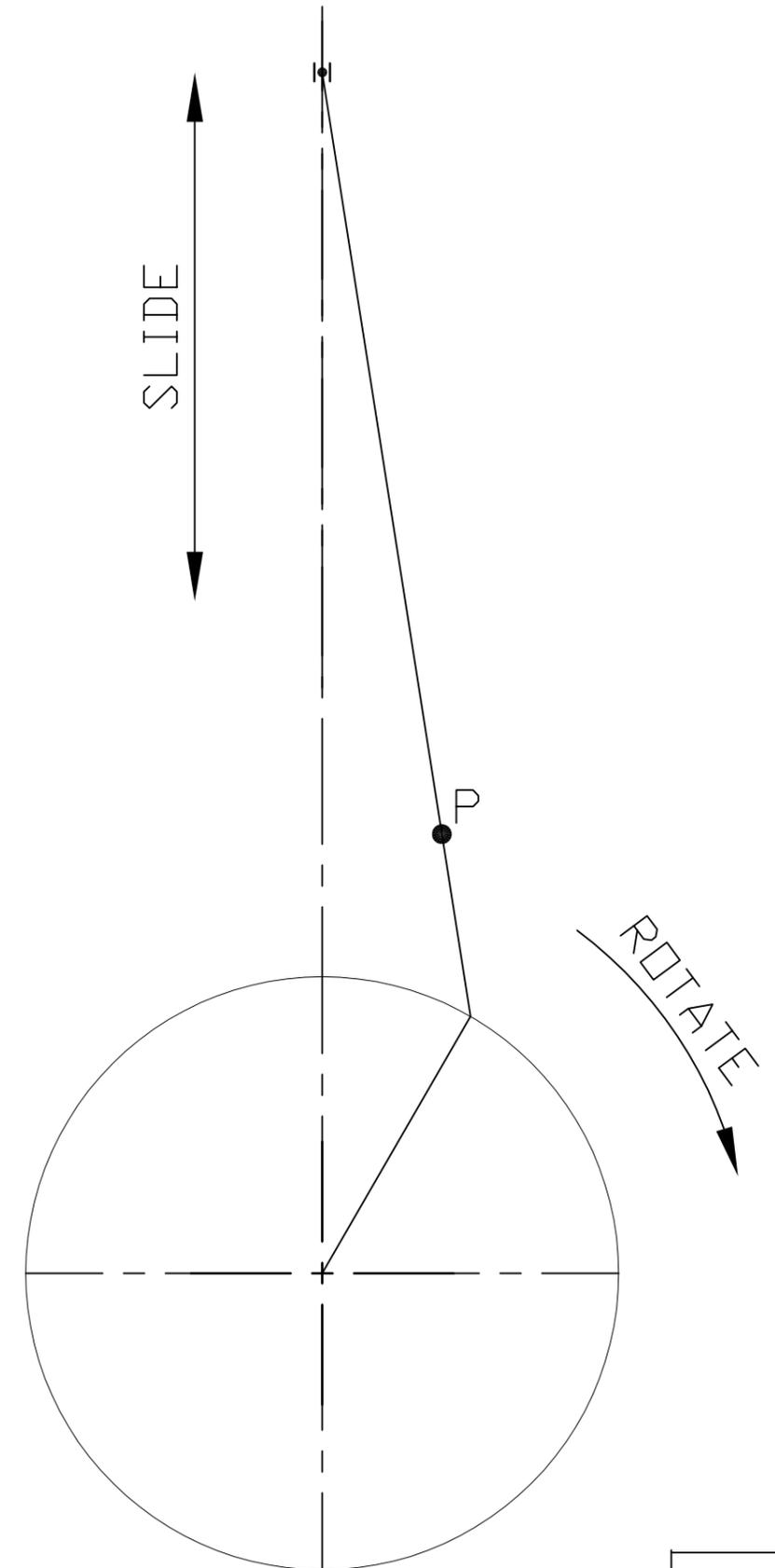
(15 marks)



2. Enlarge the given emblem so that line AB becomes line CD. (15 marks)



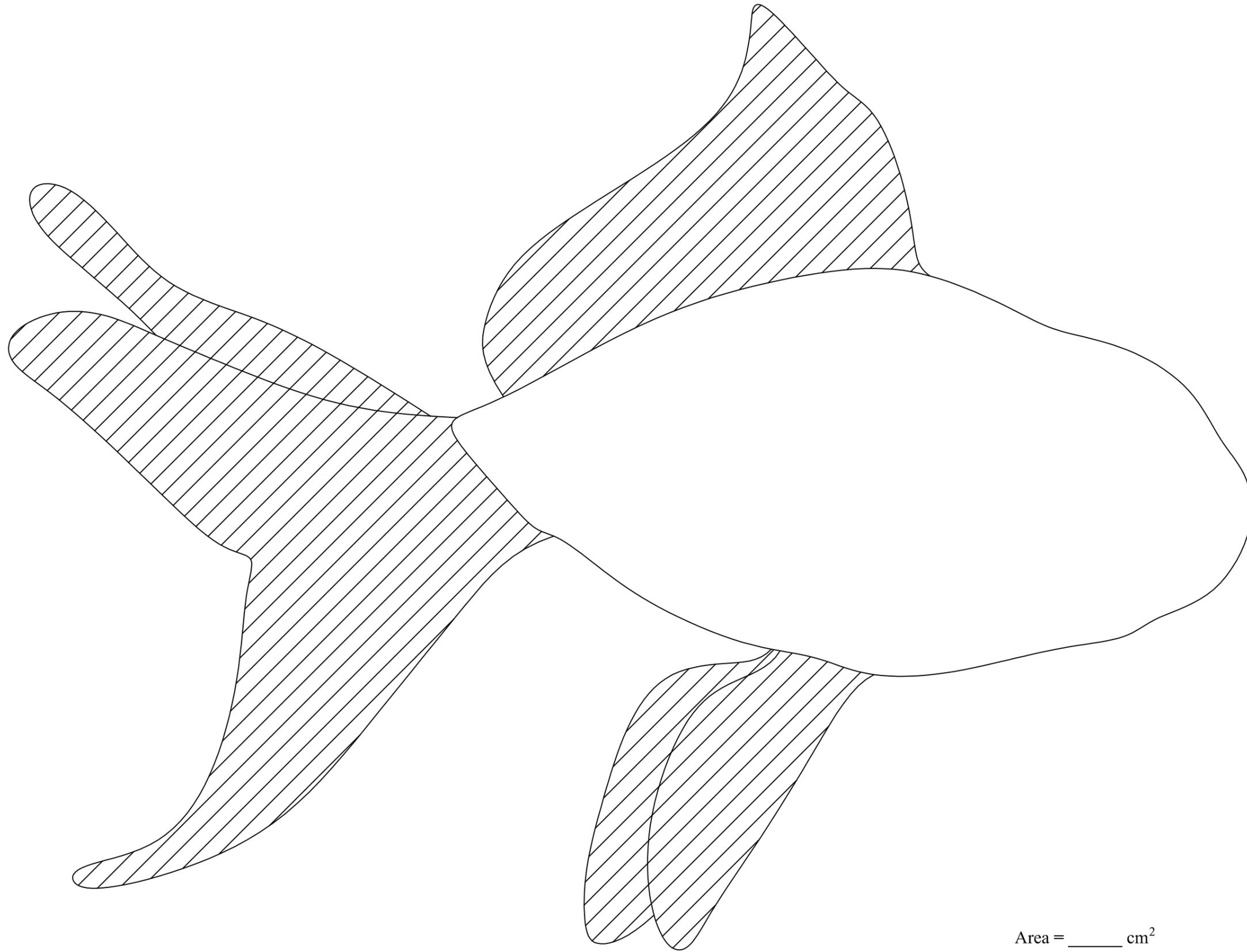
3. Find the locus of point P in the given crank and piston mechanism. (15 marks)



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4. Estimate the area of the goldfish body in cm^2 . You can use any approved method. Ignore the fins which are shaded. (15 marks)

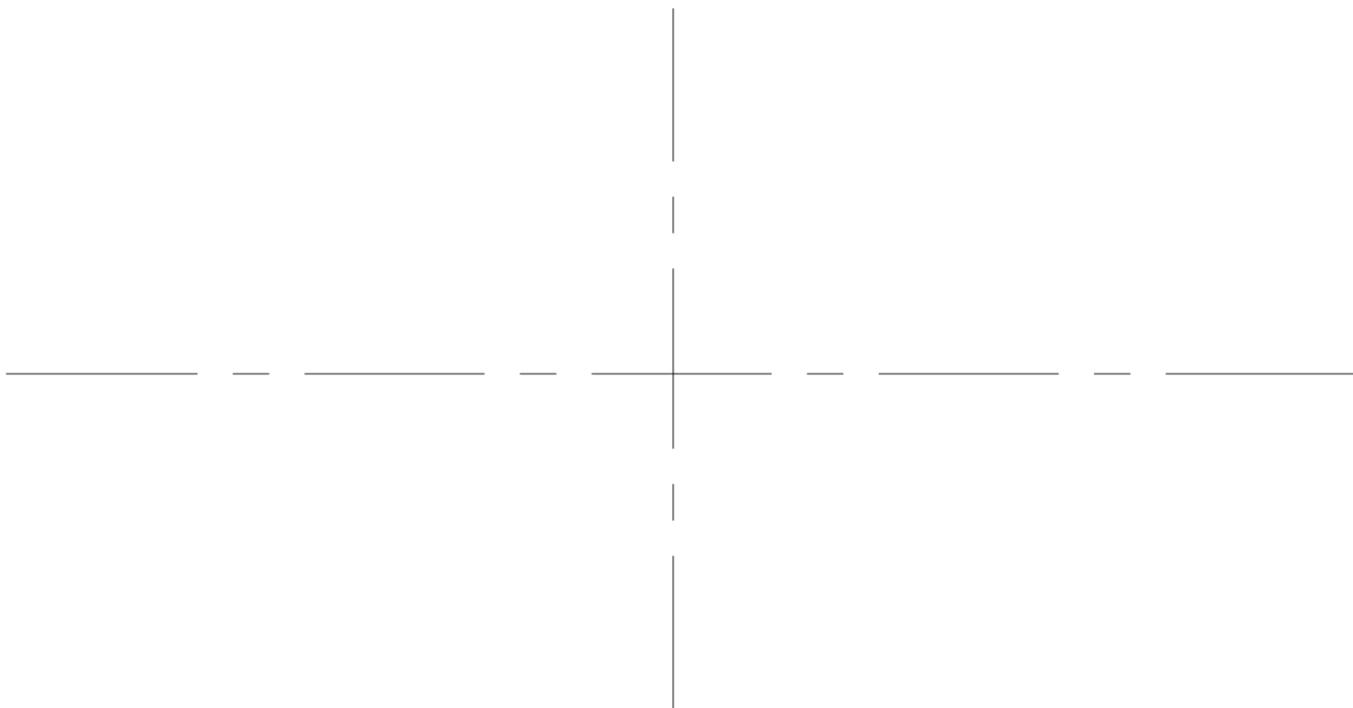
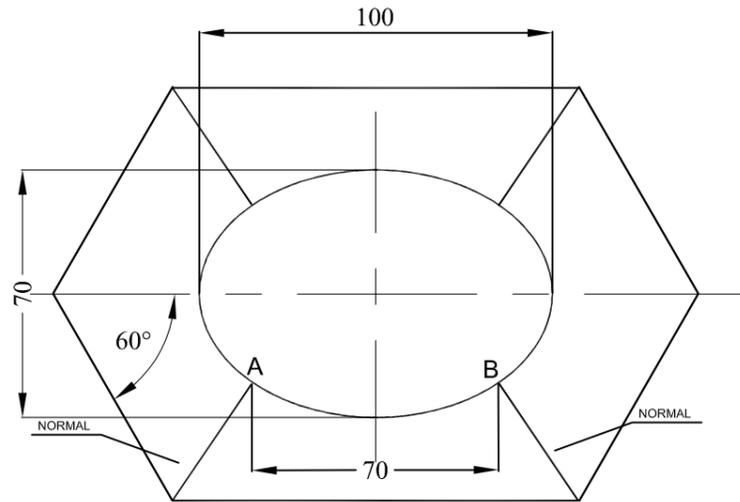


Area = _____ cm^2

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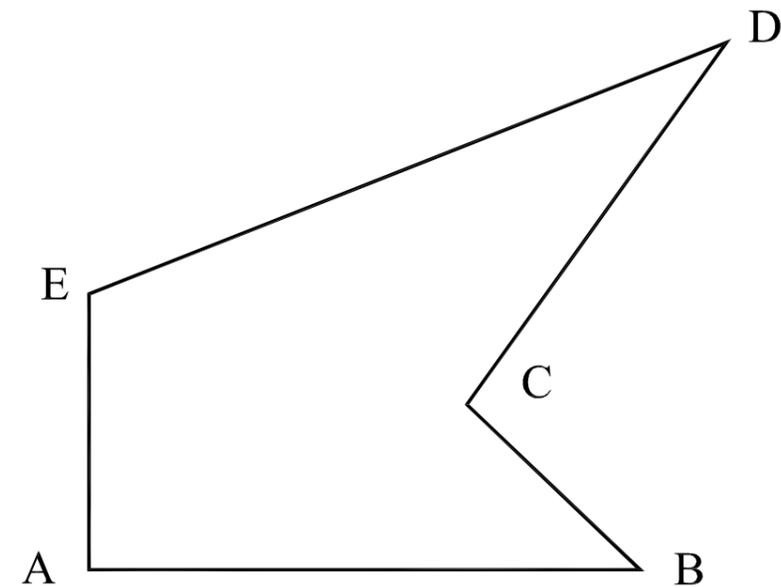


5. On the given center lines using any approved method, draw an ellipse having a major axis of 100mm and a minor axis of 70mm. Locate points A and B as shown in the diagram below and draw **normals**, showing appropriate constructions. Reflect normals on ellipse on upper part and complete the diagram as shown below. (15 marks)



6. The figure below shows an irregular pentagon 'ABCDE'. By means of geometrical construction draw a square having the same area as the given pentagon. Measure and state the length of the side of the square to the nearest millimeter.

15 marks

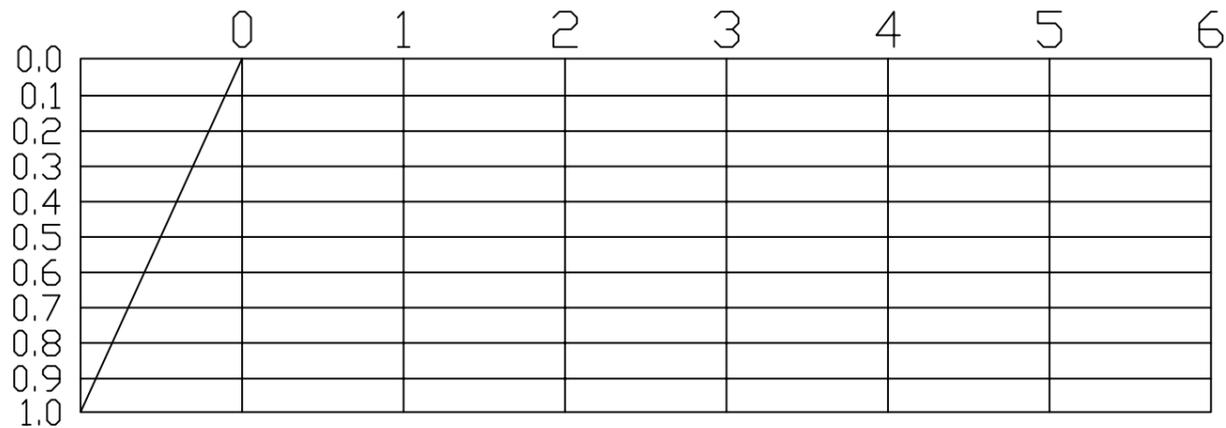
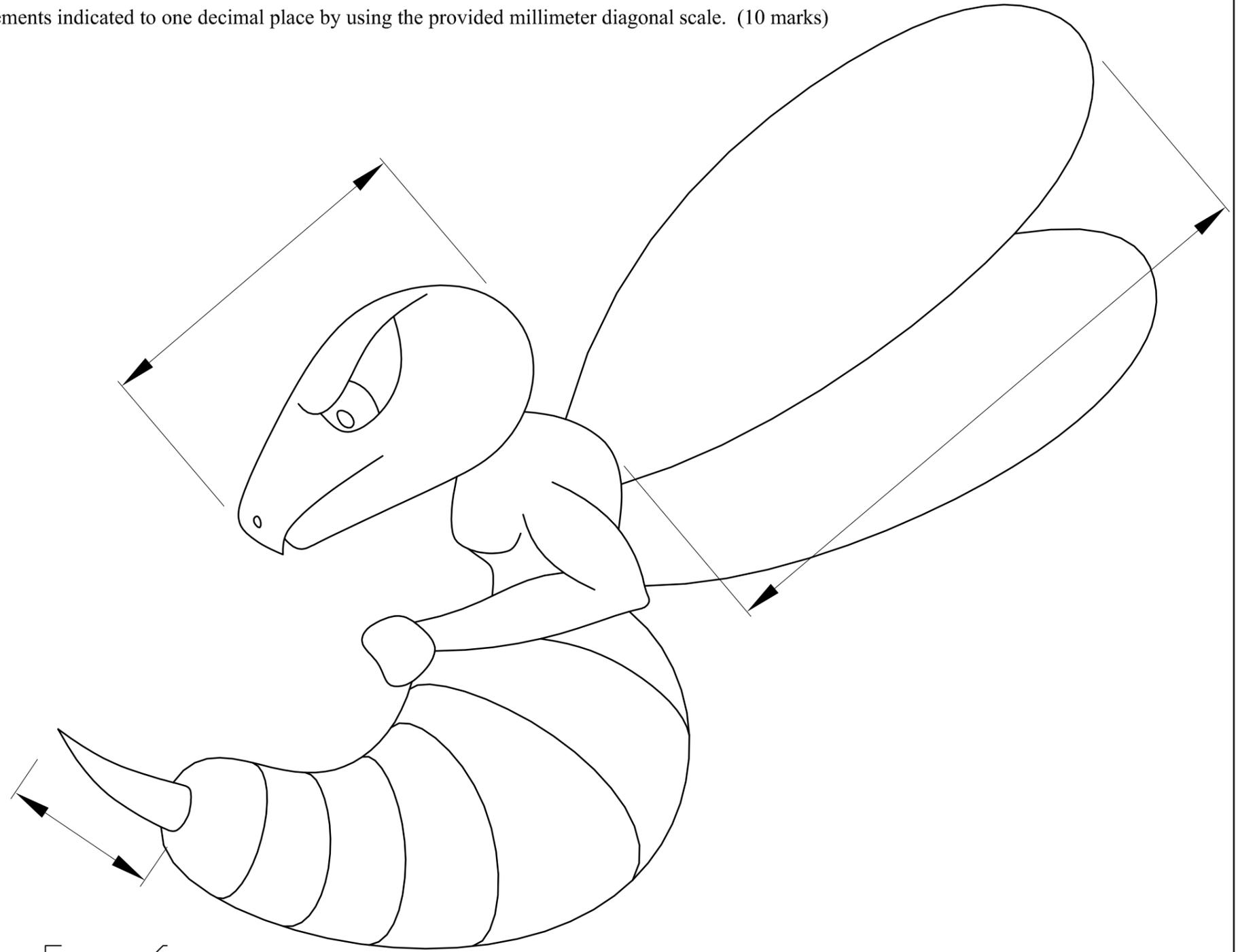


Side of square = _____ mm

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7. An unusual wasp is being examined under the microscope. List the measurements indicated to one decimal place by using the provided millimeter diagonal scale. (10 marks)



Head = ____ mm

Wing = ____ mm

Stinger = ____ mm

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