Question 1.

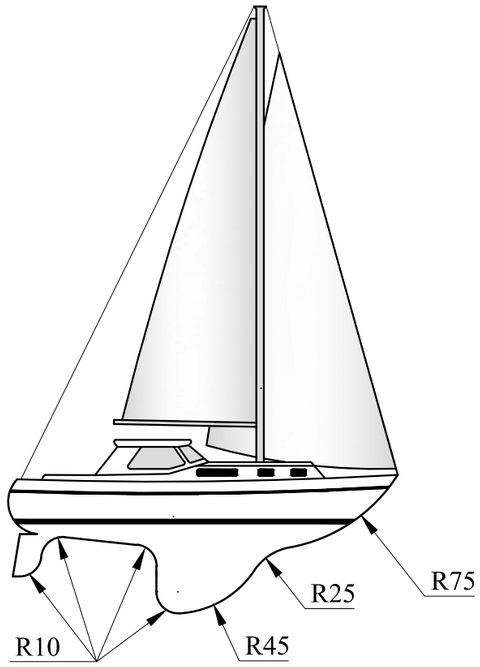
The figure on the right shows the side view of a sailing boat. An incomplete profile is given below. Using the given start lines and dimensions, complete the hull of the boat.

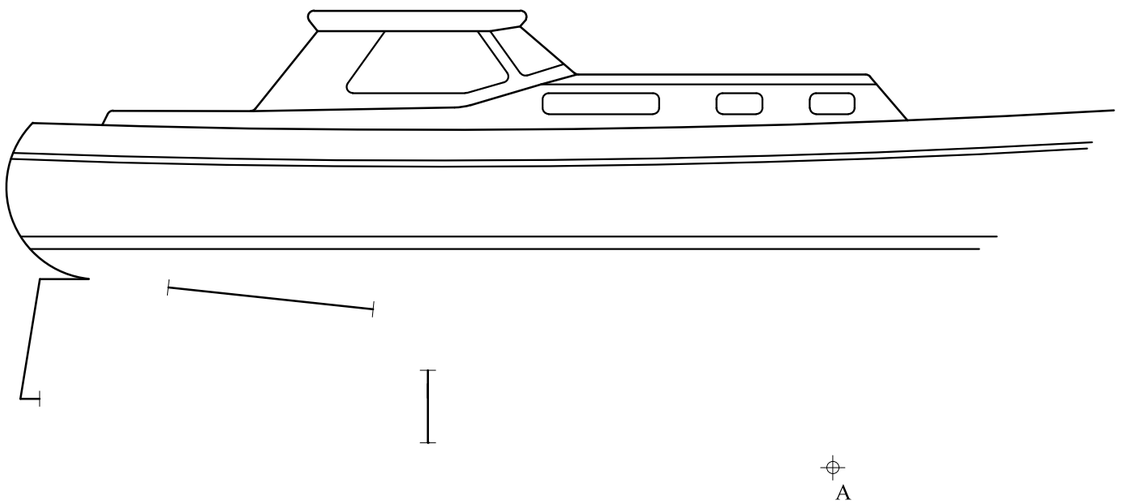
All constructions to locate the centres and the points of tangencies are to remain visible.

Notes:

1. *A is the centre of R25.*
2. *Points of tangencies are denoted by short dashes.*
3. *Do not draw the sail.*

12 marks





Question 2.

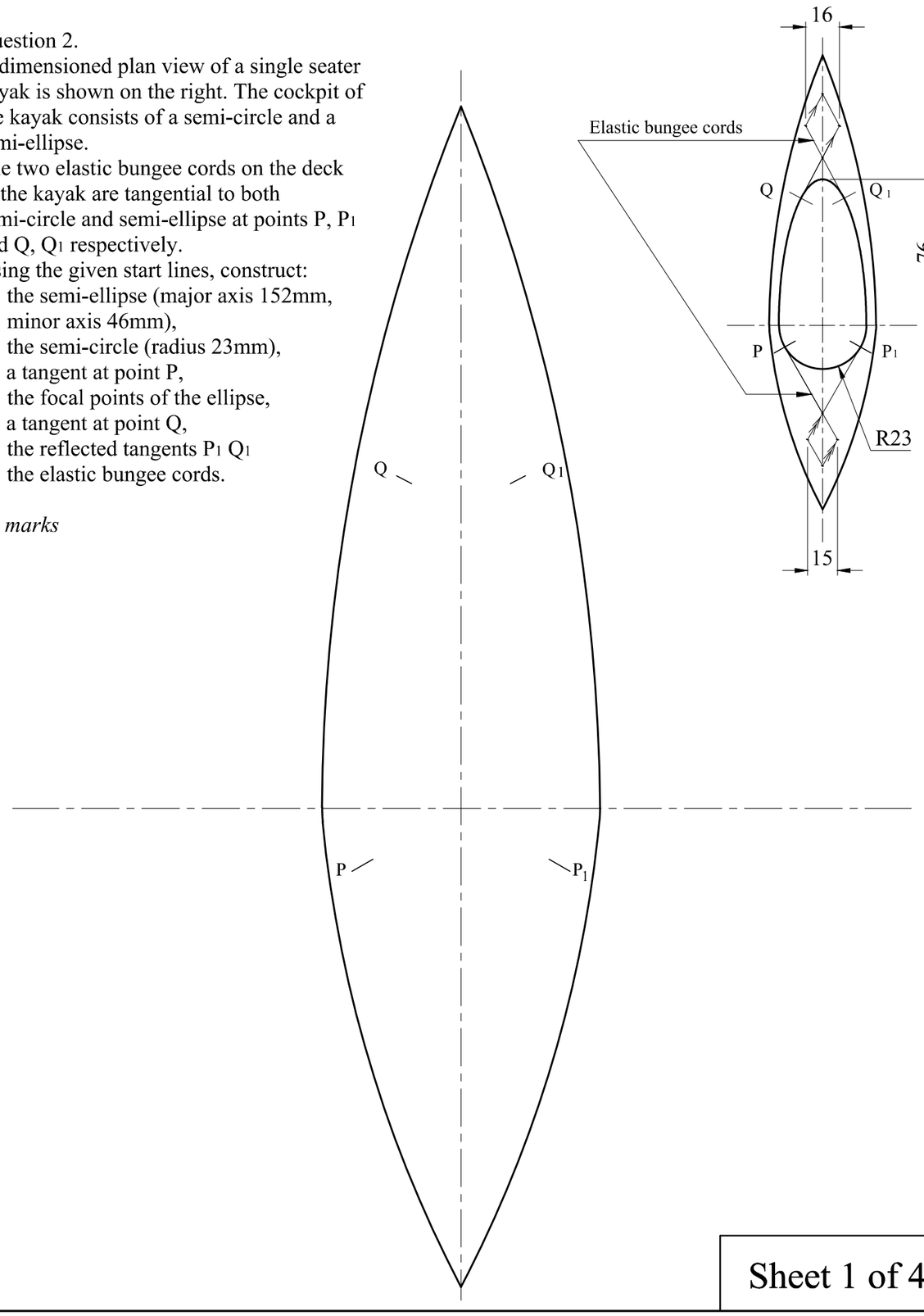
A dimensioned plan view of a single seater kayak is shown on the right. The cockpit of the kayak consists of a semi-circle and a semi-ellipse.

The two elastic bungee cords on the deck of the kayak are tangential to both semi-circle and semi-ellipse at points P, P_1 and Q, Q_1 respectively.

Using the given start lines, construct:

a. the semi-ellipse (major axis 152mm, minor axis 46mm),
b. the semi-circle (radius 23mm),
c. a tangent at point P,
d. the focal points of the ellipse,
e. a tangent at point Q,
f. the reflected tangents P_1 Q_1
g. the elastic bungee cords.

12 marks



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Question 3.

The figures show two different stages of drawing a **ship steering wheel**. All the construction lines of wheel 'A' have been left visible. Wheel 'B' is shown in a shaded version.

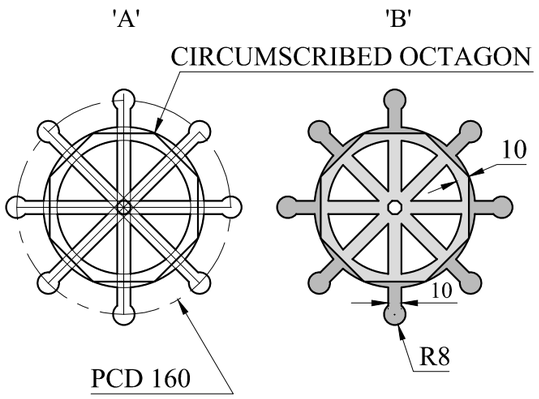
Start lines AB and BC are two sides of a regular octagon which forms part of the wheel pattern.

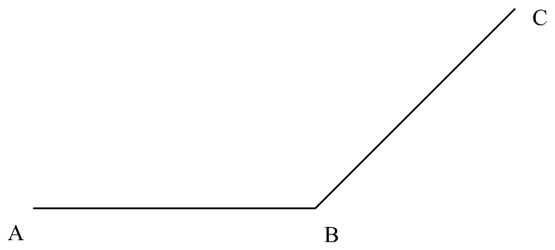
In the space provided below:

a. Circumscribe a circle touching corners A, B and C.
b. Complete the octagon.
c. Bisect the other sides of the octagon.
d. Complete the wheel by using the given dimensions.
e. Line in with bold lines where necessary.

Note: Leave all constructions visible

14 marks





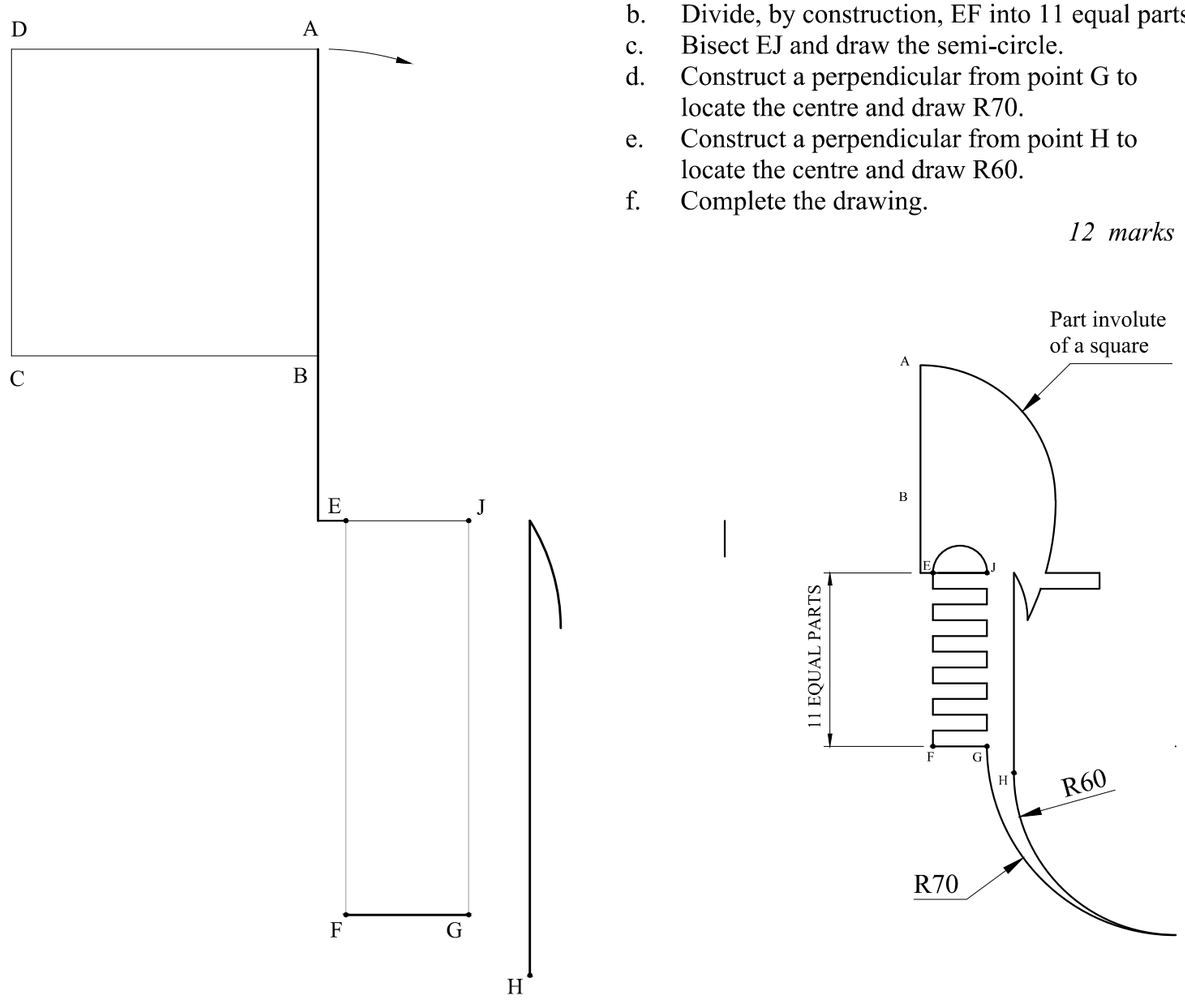
Question 4.

The dimensioned drawing below illustrates the distinctive metal design at the prow of the gondola called the "ferro".

Using the given start lines and dimensions, complete the drawing by following the given instructions:

a. Construct a part involute of the square ABCD.
b. Divide, by construction, EF into 11 equal parts.
c. Bisect EJ and draw the semi-circle.
d. Construct a perpendicular from point G to locate the centre and draw R70.
e. Construct a perpendicular from point H to locate the centre and draw R60.
f. Complete the drawing.

12 marks



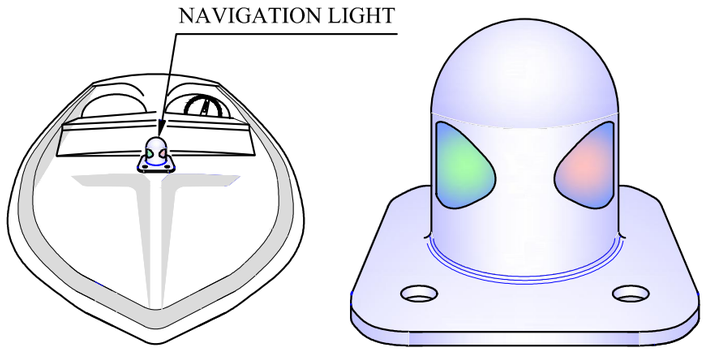
Question 5.

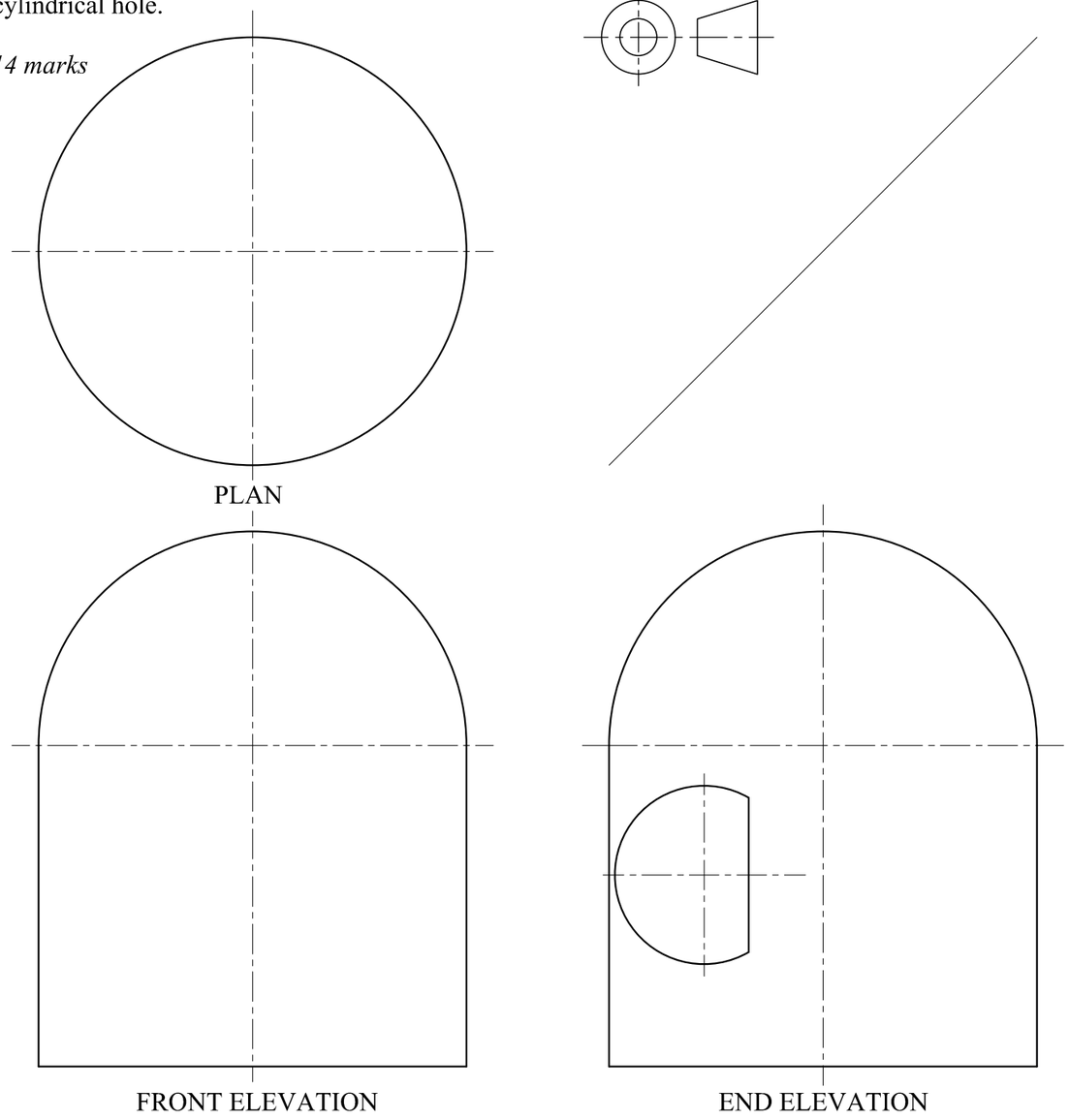
Two pictorial views of a navigation light unit to be fitted on the deck of a speedboat are shown on the right.

An incomplete front elevation, an end elevation and a plan of the upper part of the unit are given.

Complete the front elevation showing all constructions necessary to draw the curves and lines of intersection which result when the vertical cylindrical portion is intersected by a partly cylindrical hole.

14 marks





Question 6.

The windshield of a model speedboat, shown on the right, consists of a truncation of a cone.

The drawing below shows the complete front elevation and the plan of the cut cone.

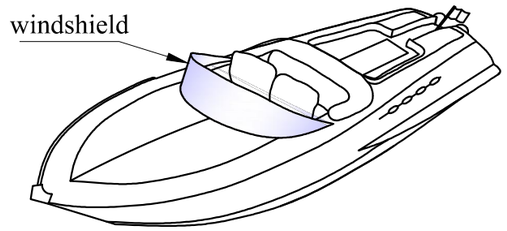
Using the given start lines, **draw the surface development of the windshield**.

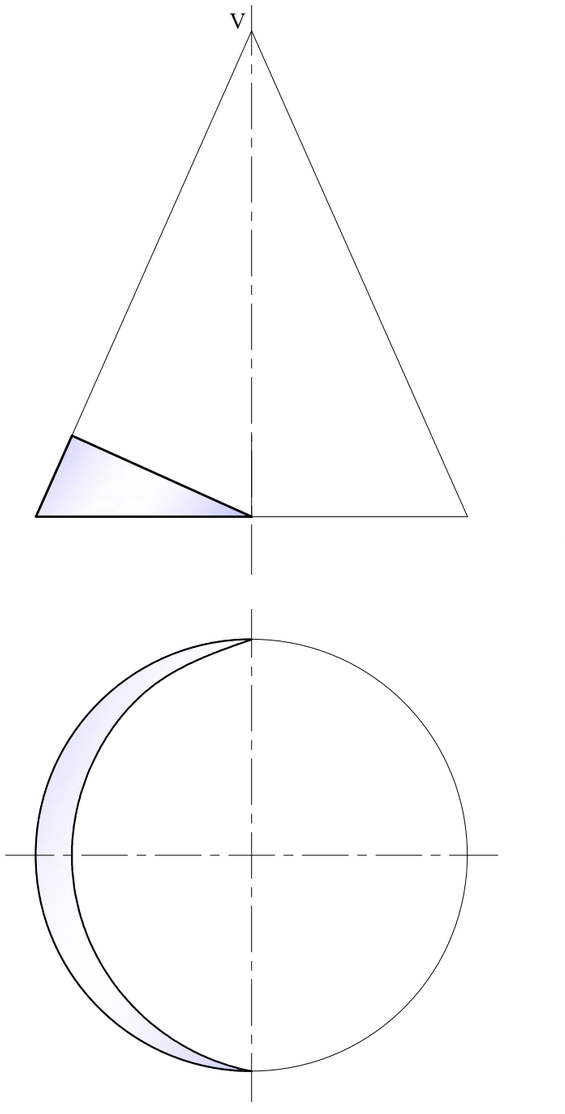
Notes:

a. Leave all constructions visible.

b. V is the vertex of the cone.

12 marks





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Question 7.

Two views of a cast aluminium bronze **boat propeller shaft bracket** are shown on the right.

An incomplete front view, a plan and an auxiliary end view are given below.

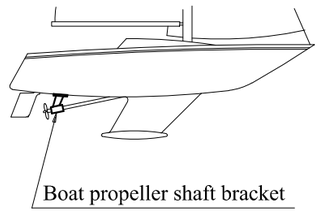
In the space provided:

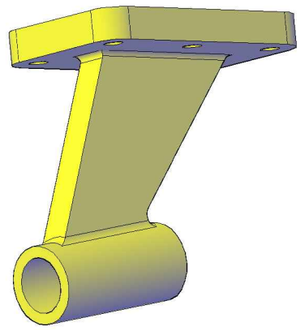
a) complete the Sectional Front X-X,

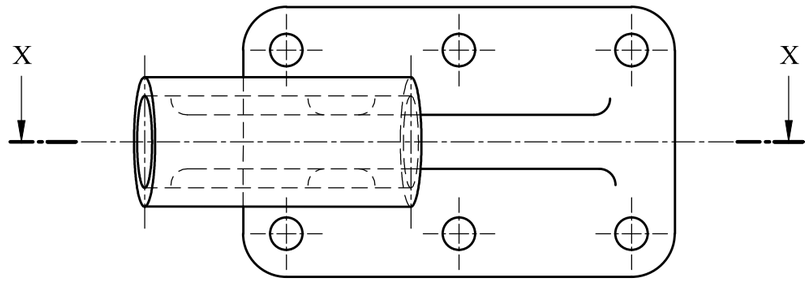
b) draw the symbol of the projection used.

Note: Do not show any hidden detail.

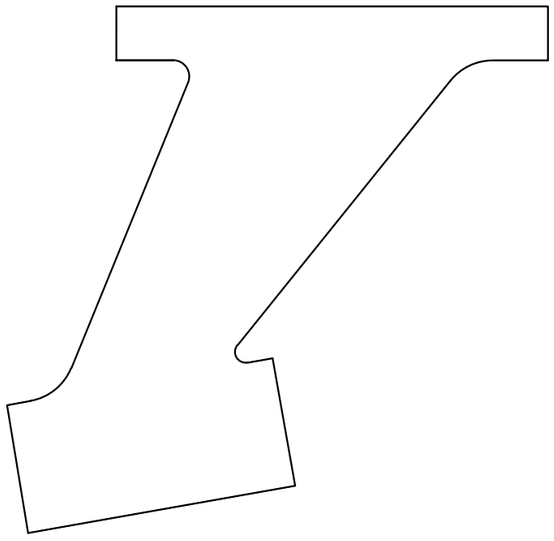
10 marks



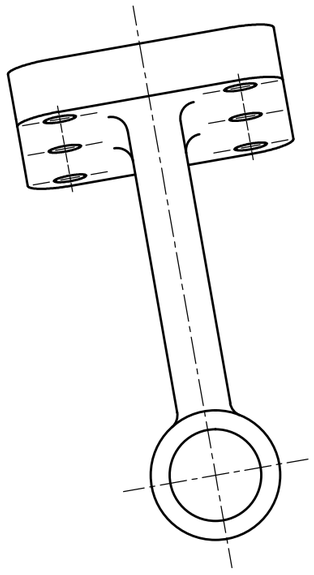




PLAN (seen from below)



SECTIONAL FRONT X-X



AUXILIARY END VIEW

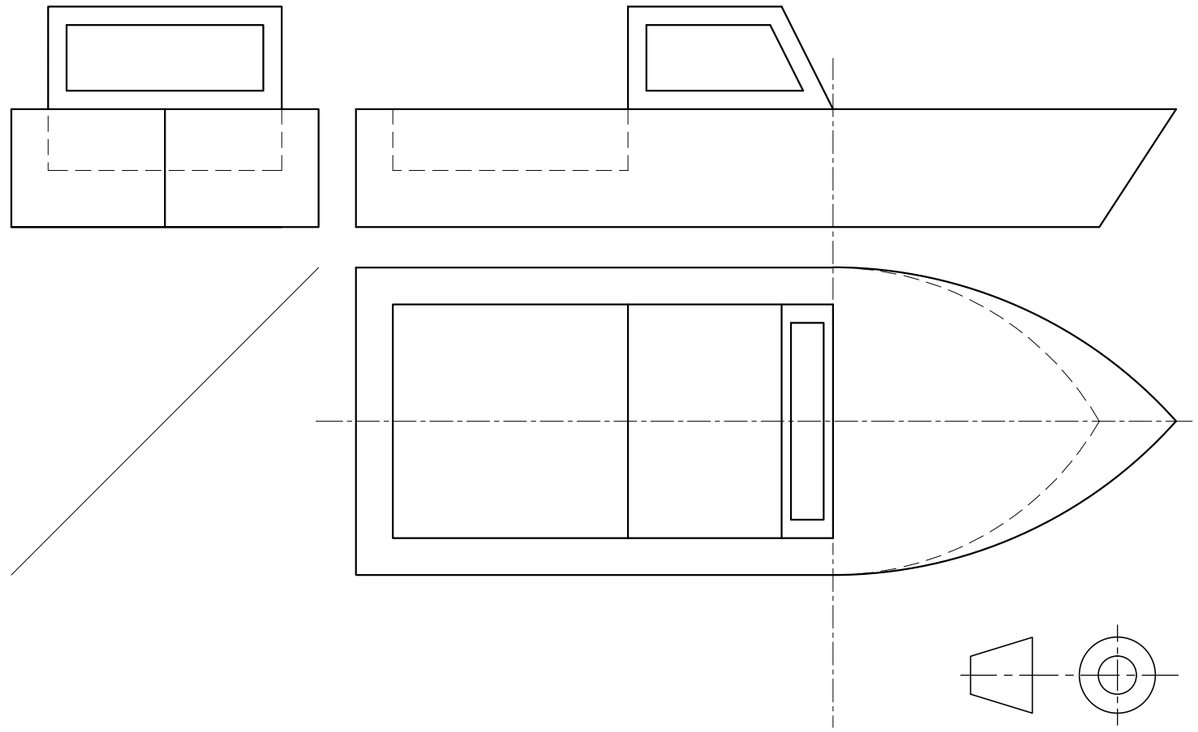
PROJECTION ANGLE

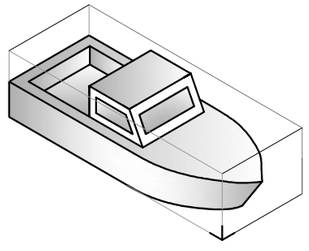
Question 8.

Three **full size** orthographic views and a scaled down isometric drawing of a solid wood toy speed boat are given. On the given start lines draw a **full size isometric projection** of the boat.

Note: The windows of the cabin consist of paper stickers on solid wood.

14 marks





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