

CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

GEOMETRICAL AND MECHANICAL DRAWING

7040/01

Paper 1

May/June 2003

2 hours 40 minutes

Additional Materials:

A2 Drawing paper (1 sheet)
Standard drawing equipment

READ THESE INSTRUCTIONS FIRST

Print your name, Centre number and candidate number at the bottom right-hand corner of your drawing paper.

Answer **five** questions.

Answer not more than **three** questions from any one section.

Unless otherwise stated, strictly geometrical methods must be used, solutions are to be drawn full size and no dimensions are required. All construction lines must be shown clearly, but lines which are parallel to, perpendicular to or inclined at angles of 30° , 45° or 60° to other lines may be drawn without showing construction lines.

Use both sides of the drawing paper for your answers.

The number of marks is given in brackets [] at the end of each question or part question.

All dimensions are in millimetres unless otherwise stated.

This document consists of **9** printed pages and **3** blank pages.



Section 1 Plane Geometry

Answer not more than **three** questions from this section.

- 1 (a) (i) Construct the triangle ABC shown in Fig. 1. [4]
(ii) Reduce the triangle ABC to a square having a similar area. Measure and state the length of side of the square to the nearest mm. [11]

- (b) A piece of thin wire, 170 mm long, is formed into a triangle. Construct the triangle whose sides are in the ratio of

$$2.8 : 4.3 : 5.6$$

[5]

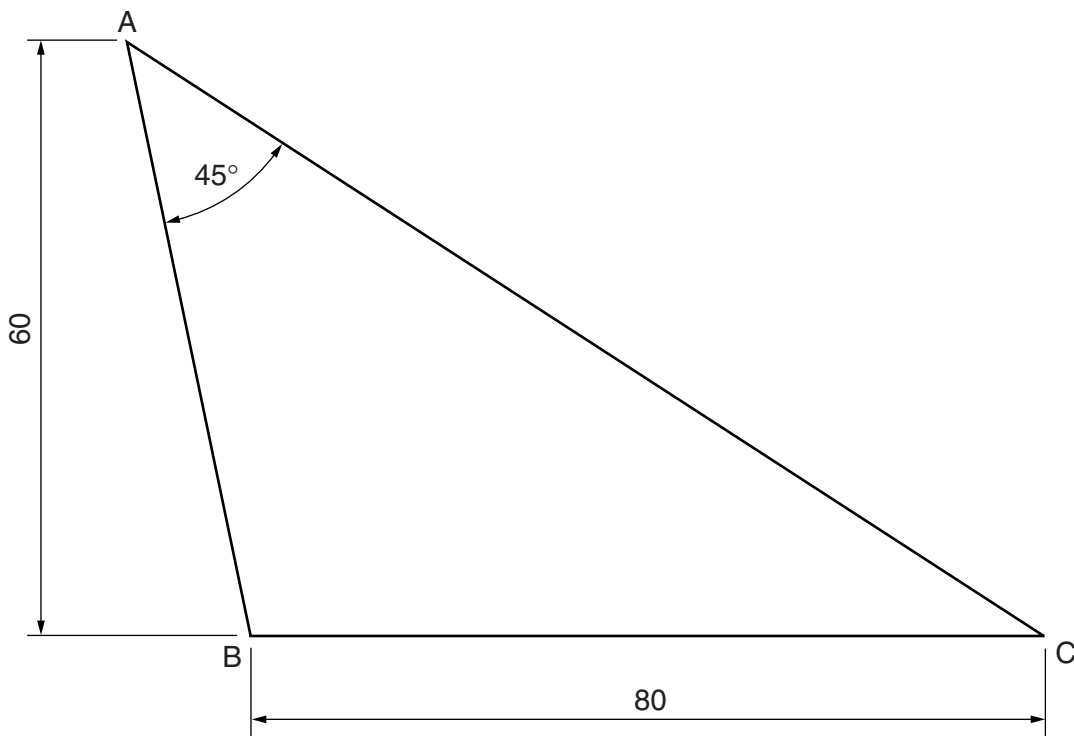


Fig. 1

- 2 Fig. 2 represents the diagrammatic arrangement of a mechanism in which O is a fixed centre about which a disc of radius OA rotates. The rigid link BE is attached to the disc and the rigid link CB by pivot joints at A and B. A fixed point S allows link BE to pivot and slide as OA rotates. Simultaneously C is constrained to reciprocate along the R110 arc.

- (a) Draw, full size, the locus of the point P when OA makes one complete revolution. [18]
- (b) State, to the nearest mm, the maximum and minimum distance that end E moves with respect to the fixed point S. [2]

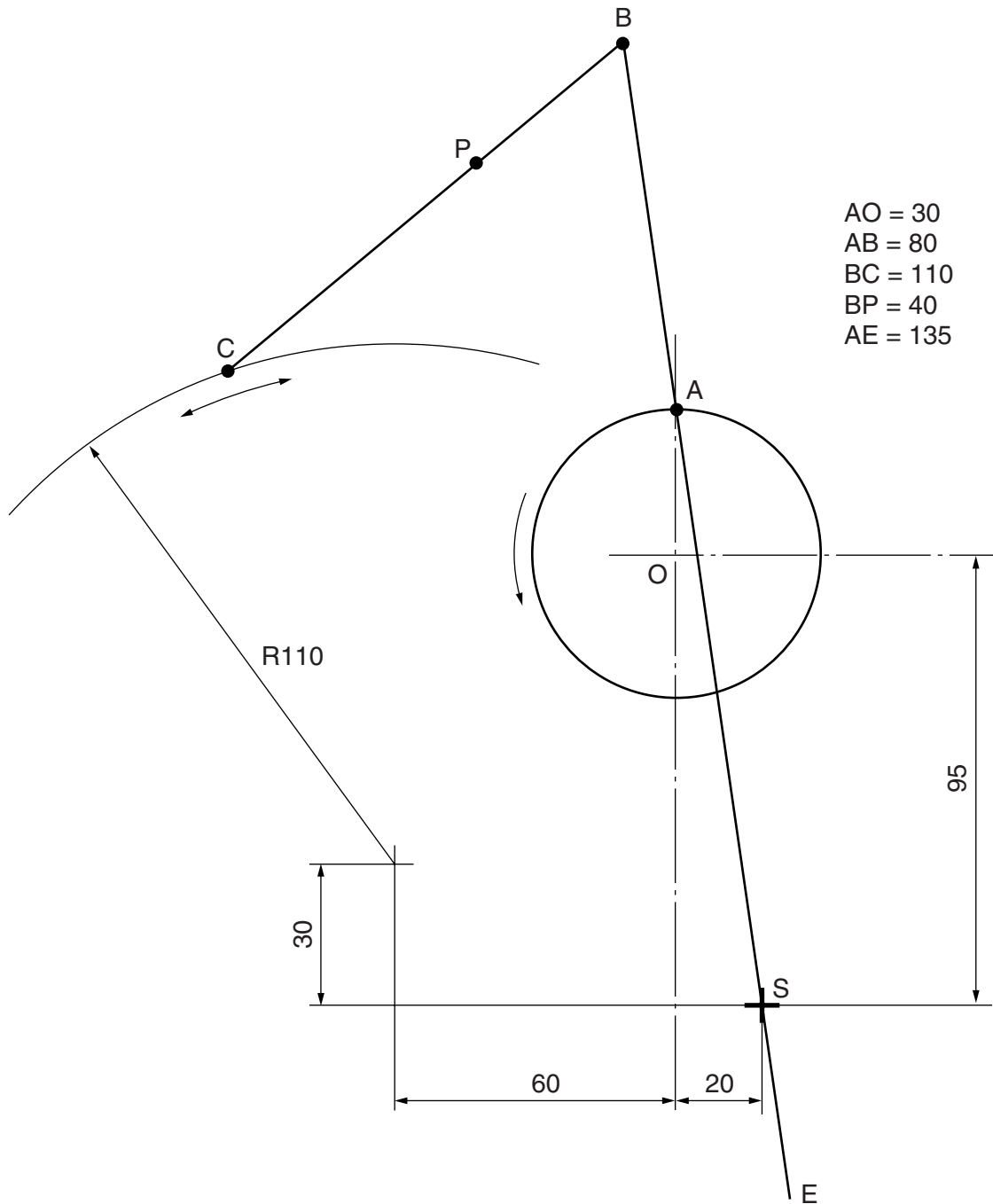


Fig. 2

3 Fig. 3 shows details of an aluminium handrail bracket.

Draw, full size, the given view of the bracket, clearly showing all construction and points of tangency. [20]

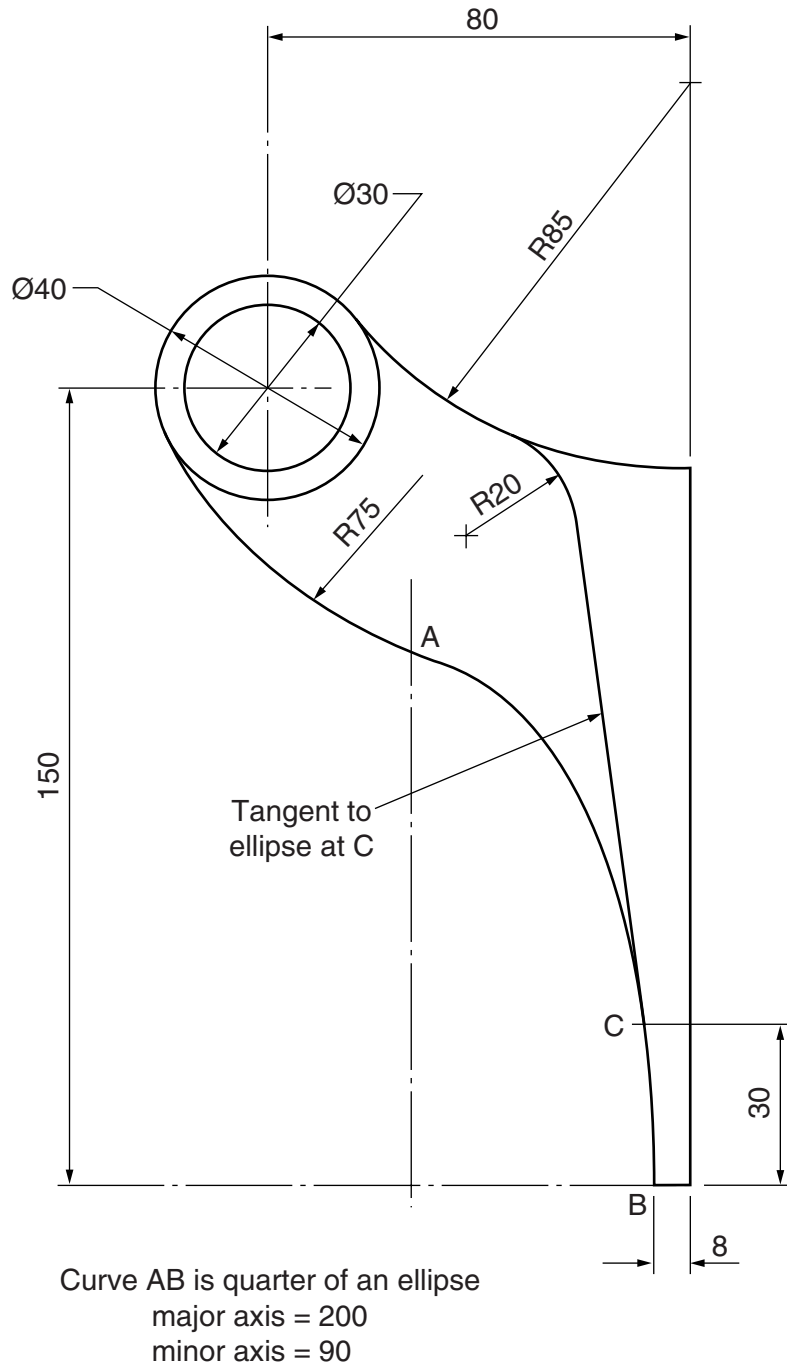


Fig. 3

Section 2 Solid Geometry

Answer not more than **three** questions from this section.

- 4 Fig. 4 shows two views of a roof drawn to a scale of 1:100. An electric cable runs from A to three lights at R, S and T on the surface of the roof.
- (a) (i) Draw the two given views. [2]
- (ii) Show, on these views, the position of the electric cables, which in each case appear to be straight lines across the roof in the plan view. [3]
- (b) Determine and state the length of each piece of cable in metres. [15]

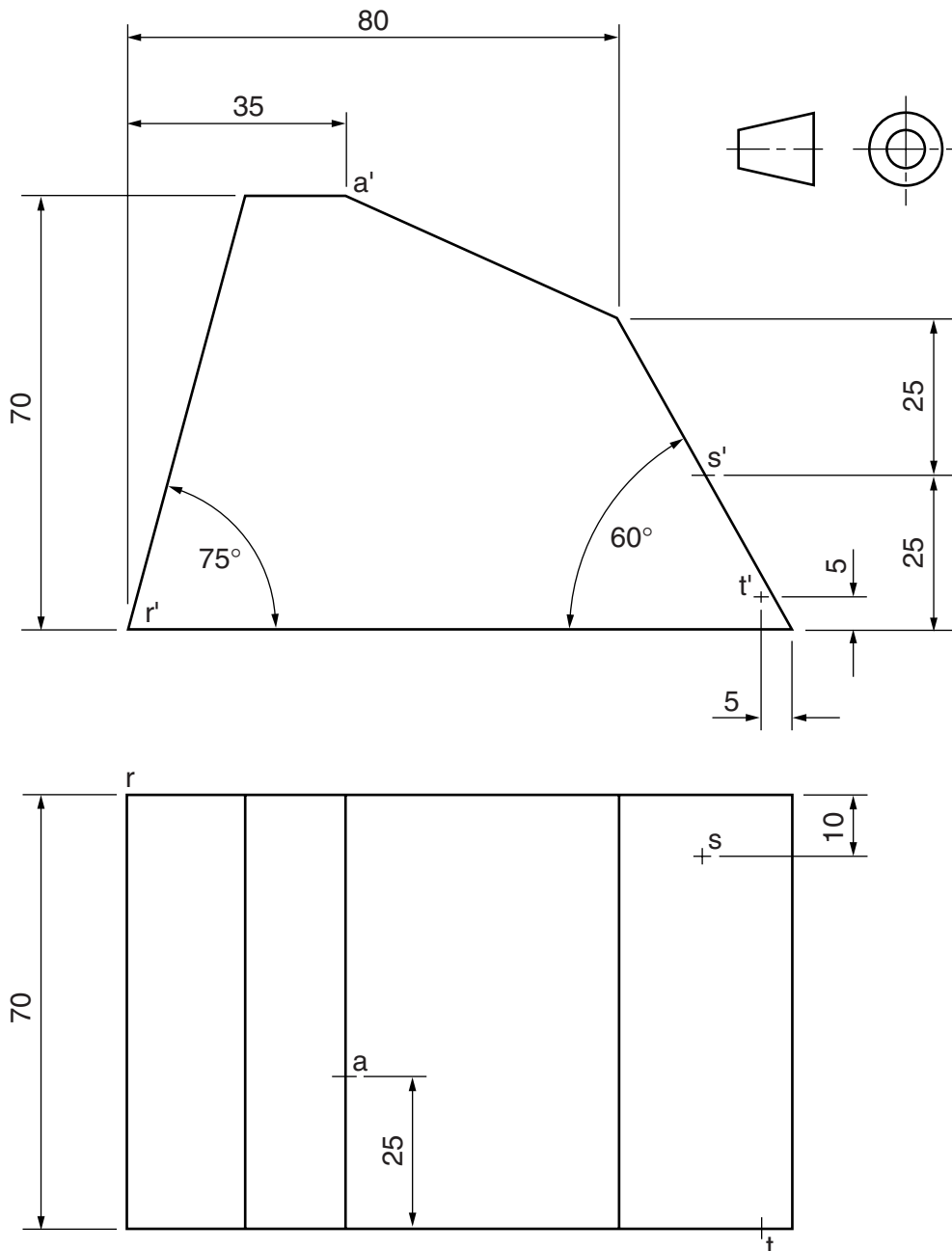


Fig. 4

5 Fig. 5 shows two views of a retaining clip in first angle projection. Ignoring the thickness of the material:

- (a) draw, full size, the given views; [2]
- (b) project an auxiliary plan from the given elevation onto the ground line X_1Y_1 when looking in the direction of arrow B; [9]
- (c) from your auxiliary plan (b) project an auxiliary elevation onto the X_2Y_2 line when looking in the direction of arrow A. [9]

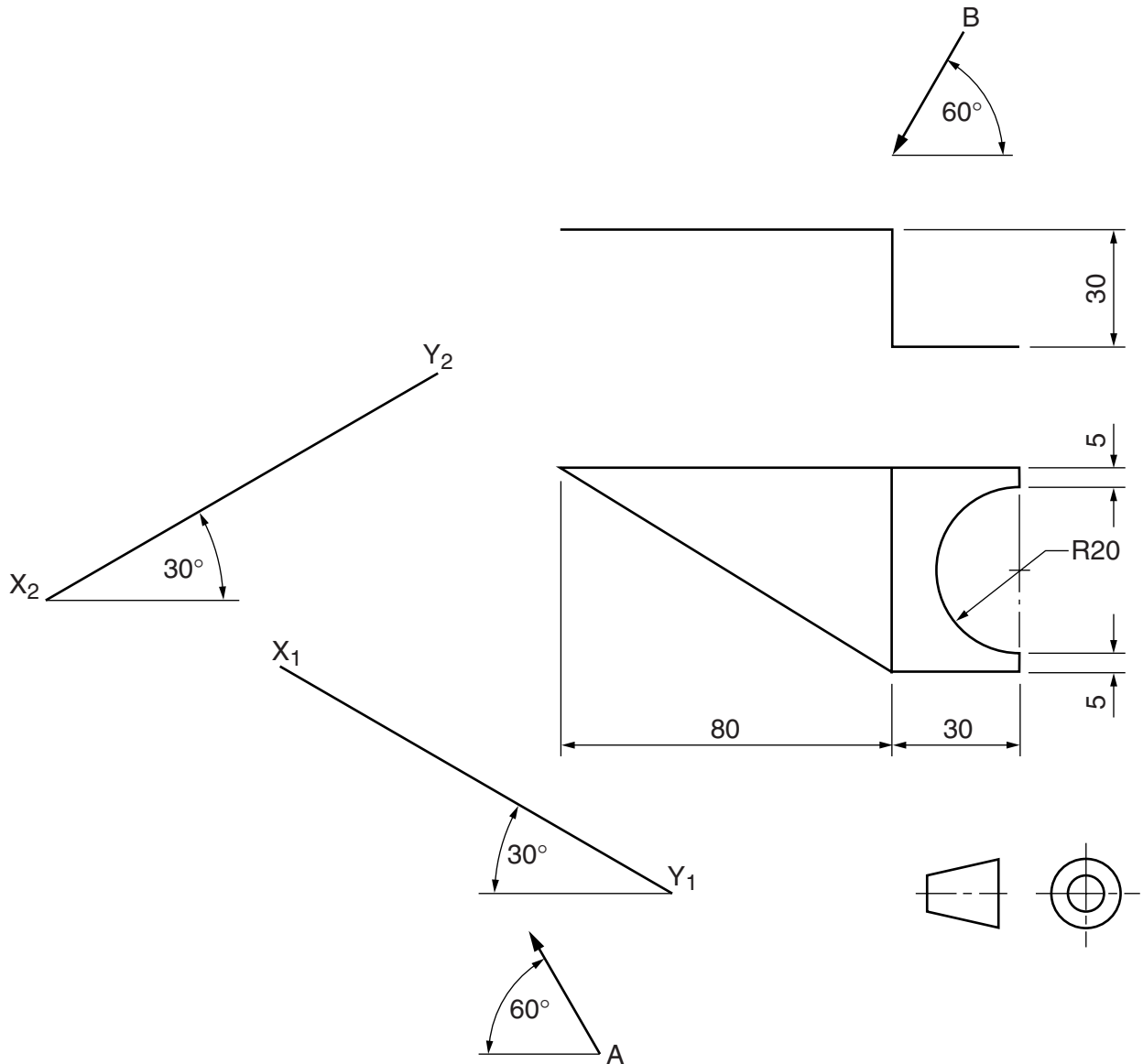


Fig. 5

- 6 Fig. 6 shows details of a cylindrical pipe intersecting a semi-circular piece. Ignoring the thickness of the material.

Draw, full size:

- (a) the given views; [2]
 (b) a plan view that includes the curve of intersection and all hidden detail; [12]
 (c) the development for the semi-circular piece AB. Include the true shape of the hole. [6]

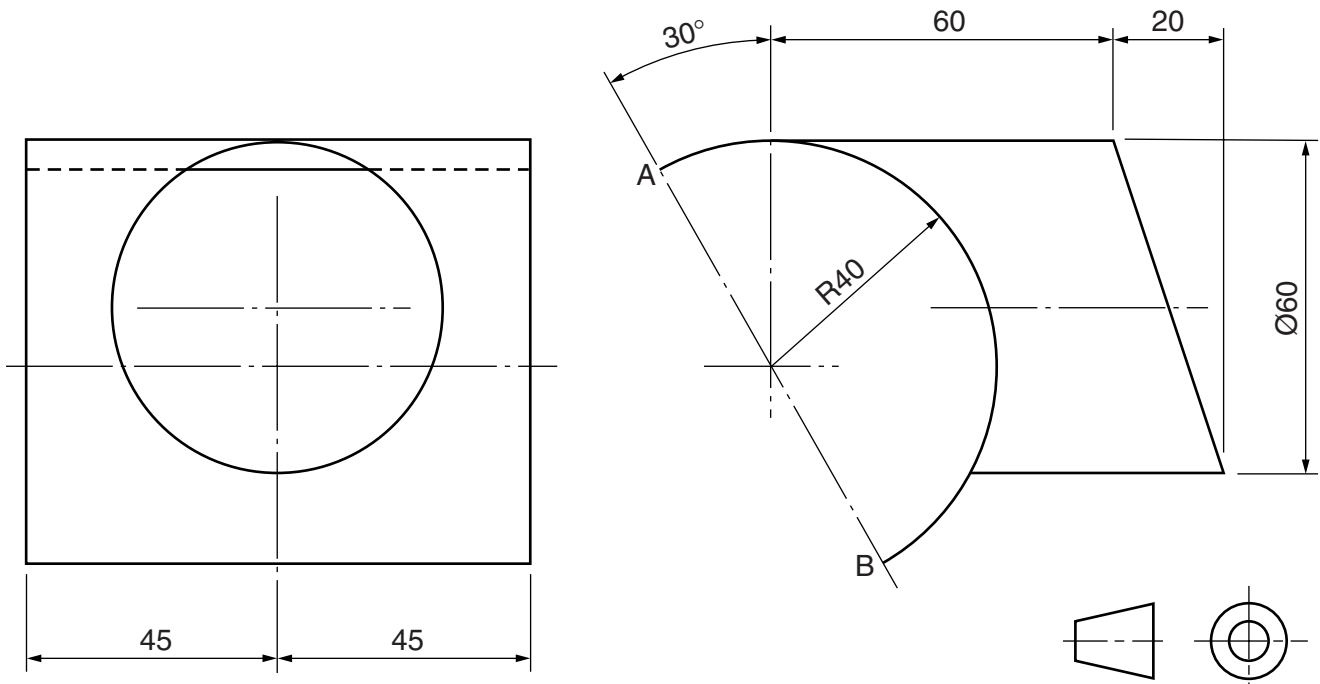


Fig. 6

- 7 Fig. 7 shows details of the blank for a threaded coupler. When complete, the blank has a left and right hand square thread machined at opposite ends.

Draw the coupling, full size, showing both threaded portions.

Hidden detail is not required.

[20]

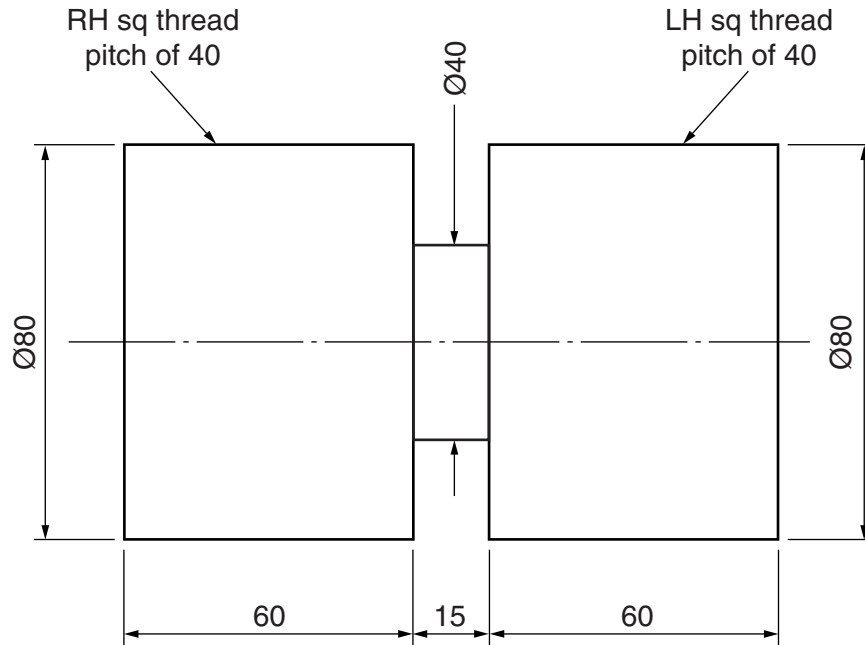


Fig. 7

8 Details of a moulded block are shown in Fig. 8.

Draw, full size, an isometric projection of the block with C in the forefront of your view. Omit hidden detail and do not use an isometric scale. [20]

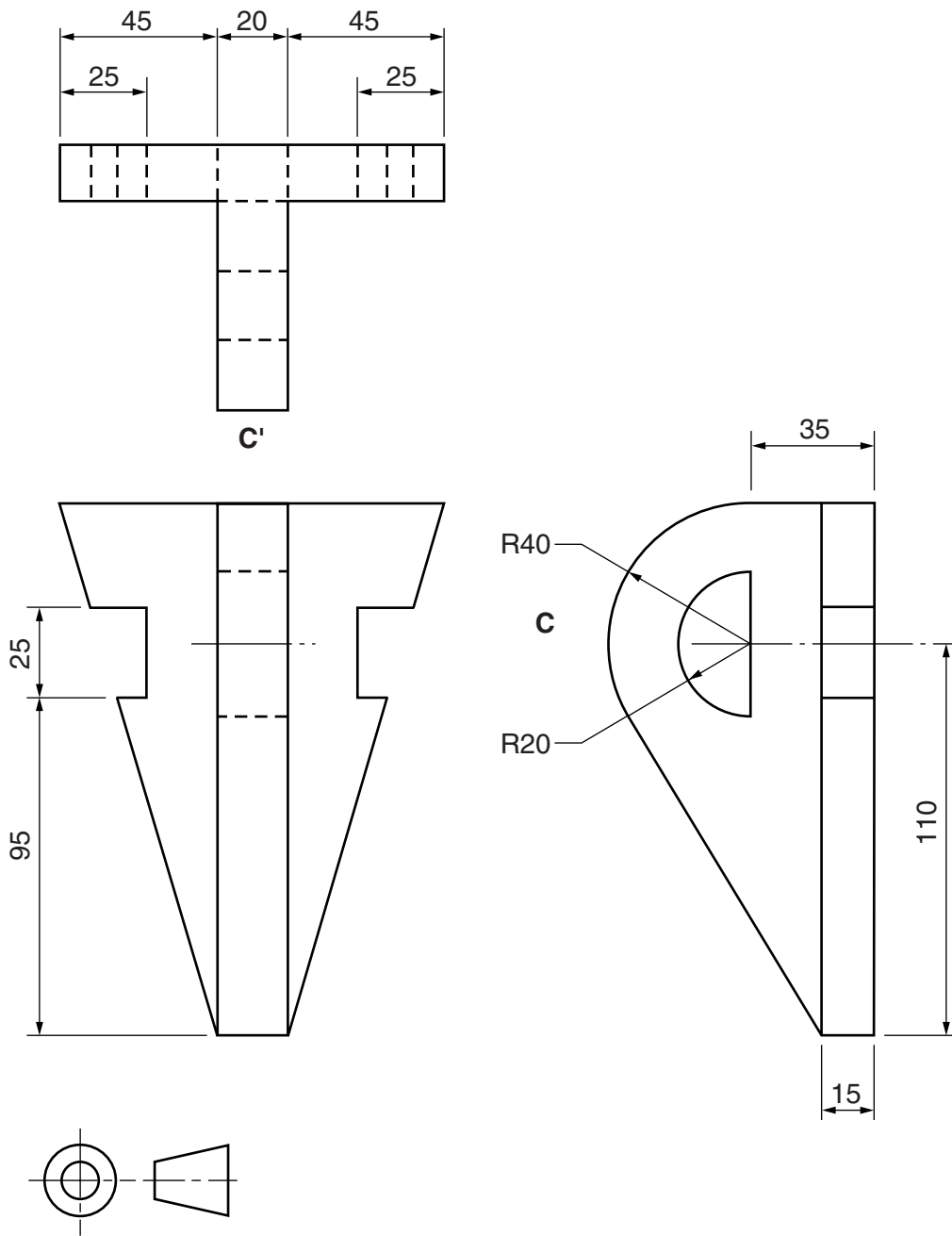


Fig. 8

