UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

GEOMETRICAL AND MECHANICAL DRAWING **7040/01**

Paper 1

October/November 2004

2 hours 40 minutes

Additional Materials: A2 Drawing Paper (1 sheet)
Standard Drawing Equipment

READ THESE INSTRUCTIONS FIRST

Print your Centre number, candidate number and name at the bottom right-hand corner of your Drawing Paper.
Use both sides of the paper for your answers.
Do not use staples, paper clips, highlighters, glue or correction fluid.

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.
At the end of the examination, fasten all your work securely together.
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.

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UNIVERSITY of CAMBRIDGE International Examinations
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Section 1 Plane Geometry

1 Fig. 1 shows the details of a proposed logo for a mining company.
Construct, full size, this logo using only geometrical construction and showing clearly the method of construction used to determine all the centres and points of tangency. [20]

ABC is a semi ellipse
120 major axis, 60 minor axis

curve **EFG** is equi-distant
from the ellipse

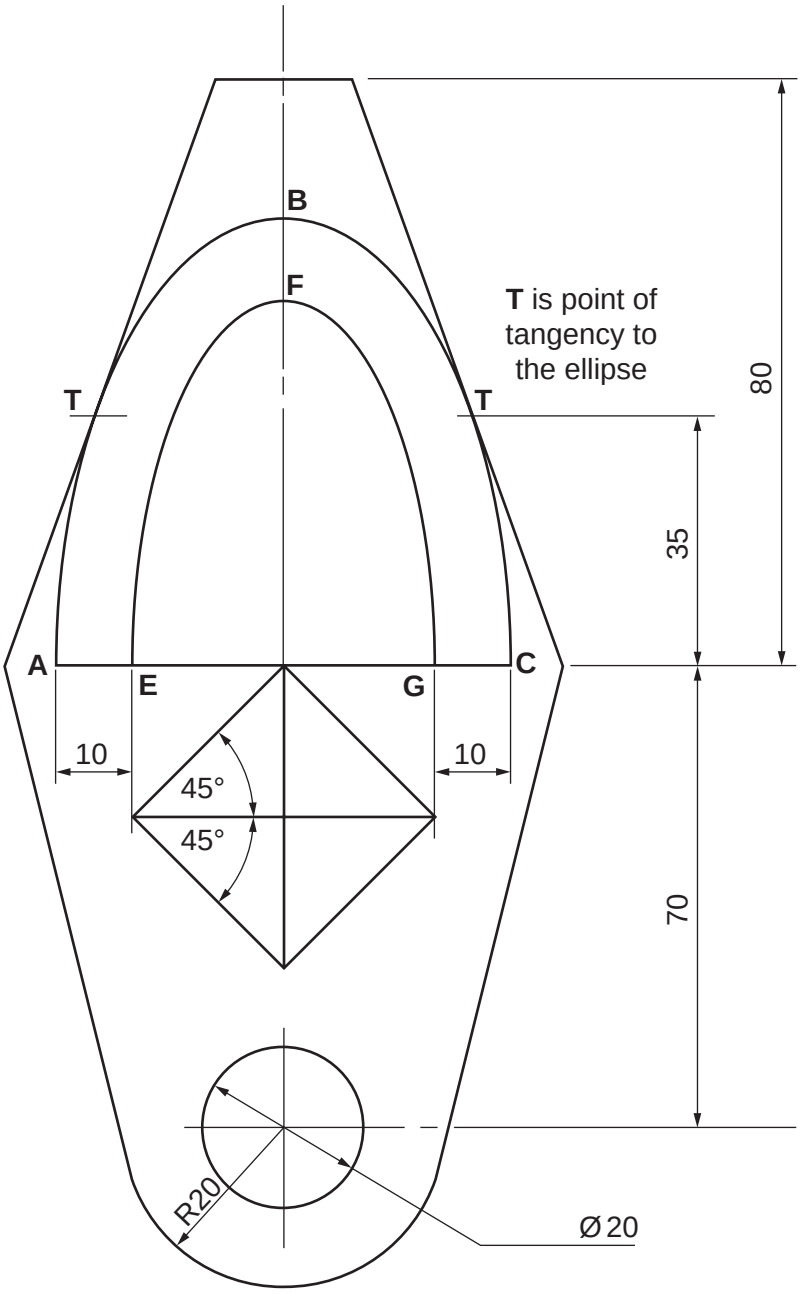


Fig. 1

2 Fig. 2 shows diagrammatic details of a crank mechanism. The crank **OA** revolves about the centre **O** and a radius arm **CB** pivots about centre **C**. They are connected by a rigid link **ABD** which is pin jointed at **A** and **B**.
Draw the locus of the point **D** for one complete revolution of crank **OA**. [20]

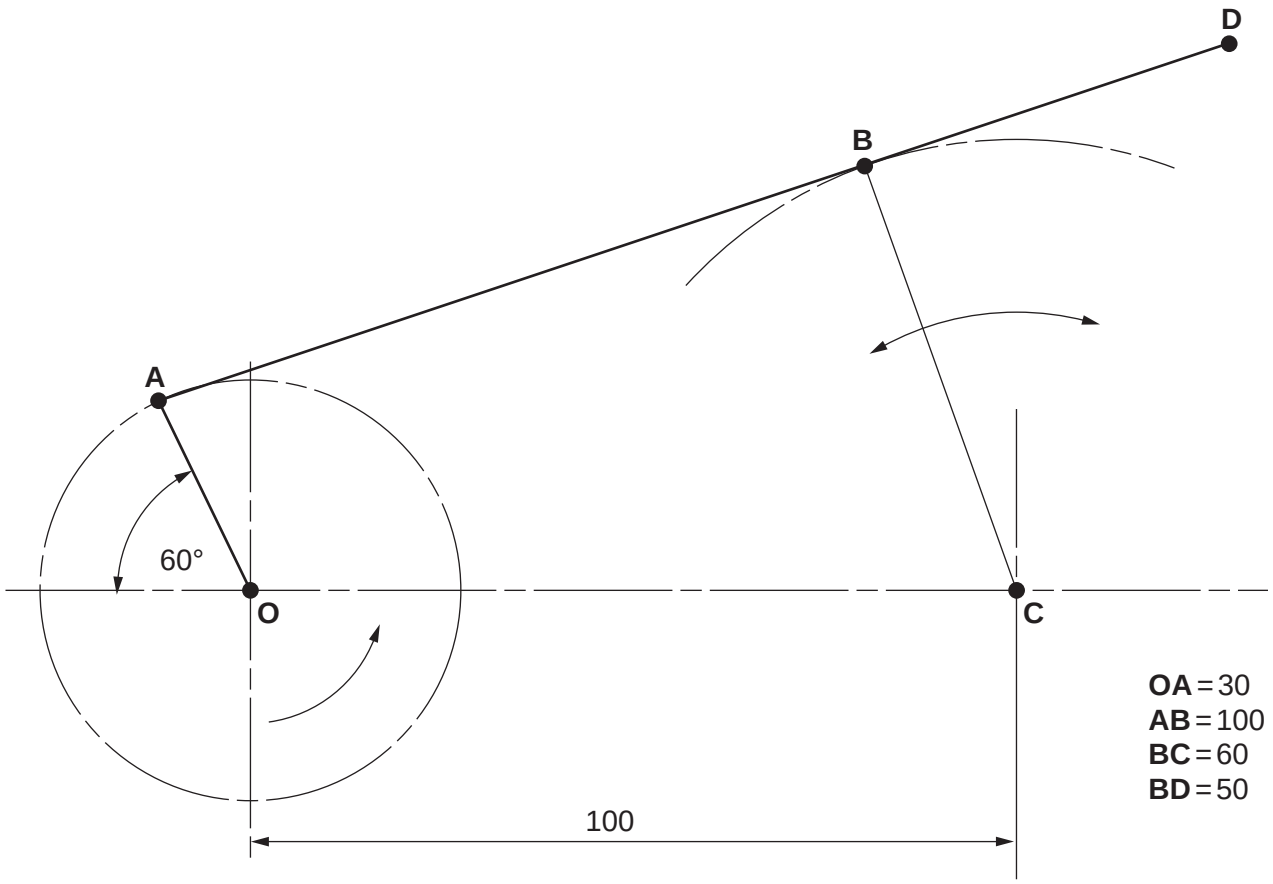
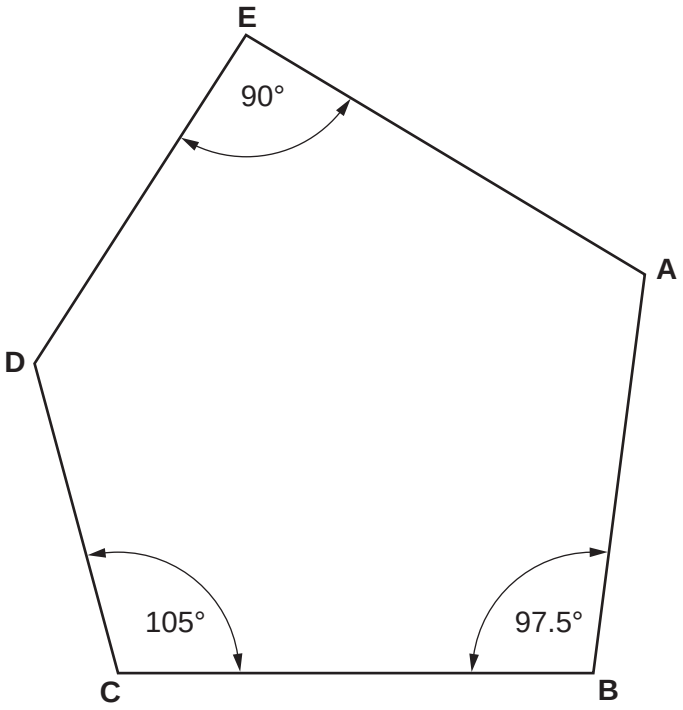


Fig. 2

3 **(a)** Construct the plane figure **ABCDE** shown in Fig. 3. [10]

(b) Construct a square having an area equal to that of Fig. 3. [9]

(c) Measure and state the size of the square to the nearest mm. [1]



AB = 70
BC = 80
CD = 60
DE = 60

Fig. 3

Section 2 Solid Geometry

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

4 Fig. 4 shows the profile of a cylinder that has been formed into a cone at one end. Parts of the cylinder and cone have been removed along the line **XX** which lies parallel to the cone's generator.

Draw full size.

(a) An elevation similar to that shown in Fig. 4, but with the portion to the left of the line **XX** removed. [3]

(b) An end elevation looking in the direction of arrow **E**. [8]

(c) A plan looking in the direction of arrow **A**. [4]

(d) The true shape of the cut face looking in the direction of arrow **T**. [5]

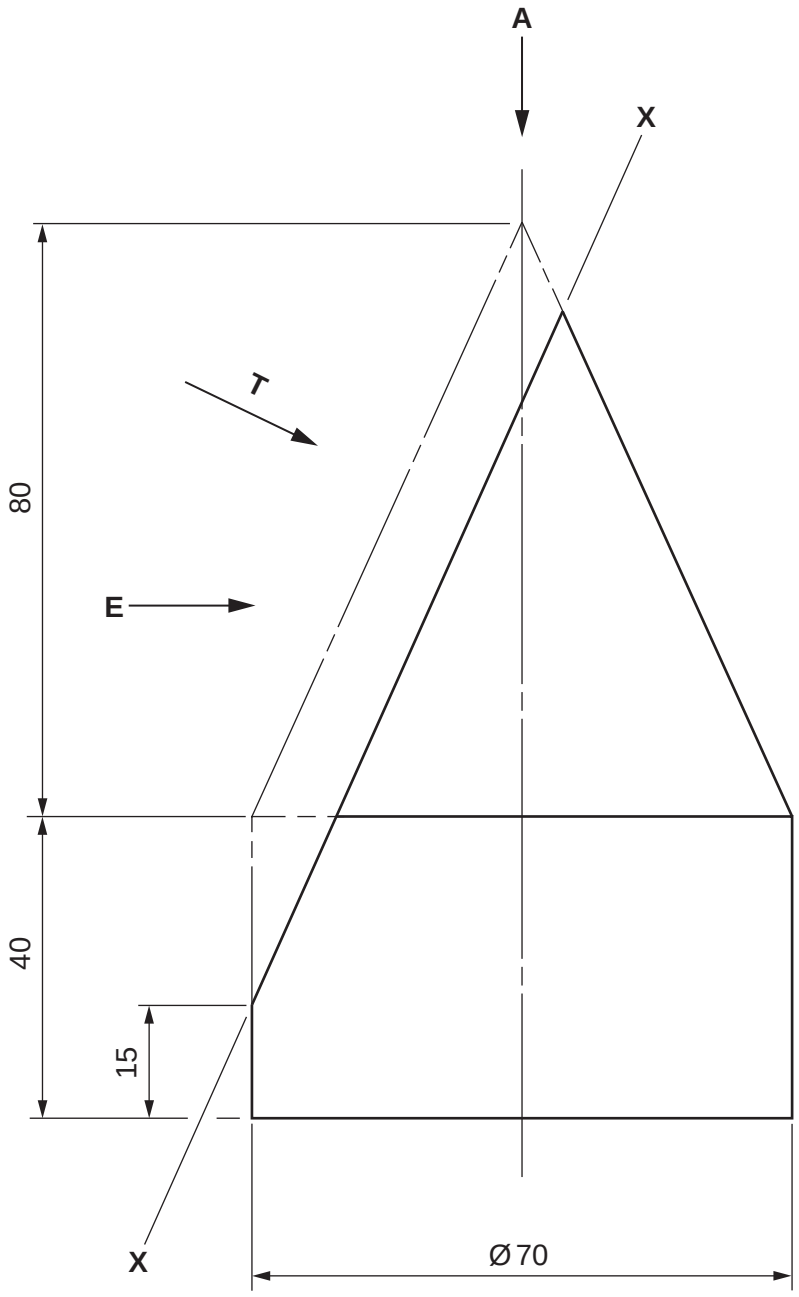


Fig. 4

[Turn over

5 Fig. 5 shows two views of a component fabricated from thin tin plate using a soldered construction.

(a) Draw the two given views. [4]

(b) Draw an end elevation looking in the direction of arrow **A**, showing all hidden detail. [10]

(c) Draw the development of the cylindrical portion. [6]

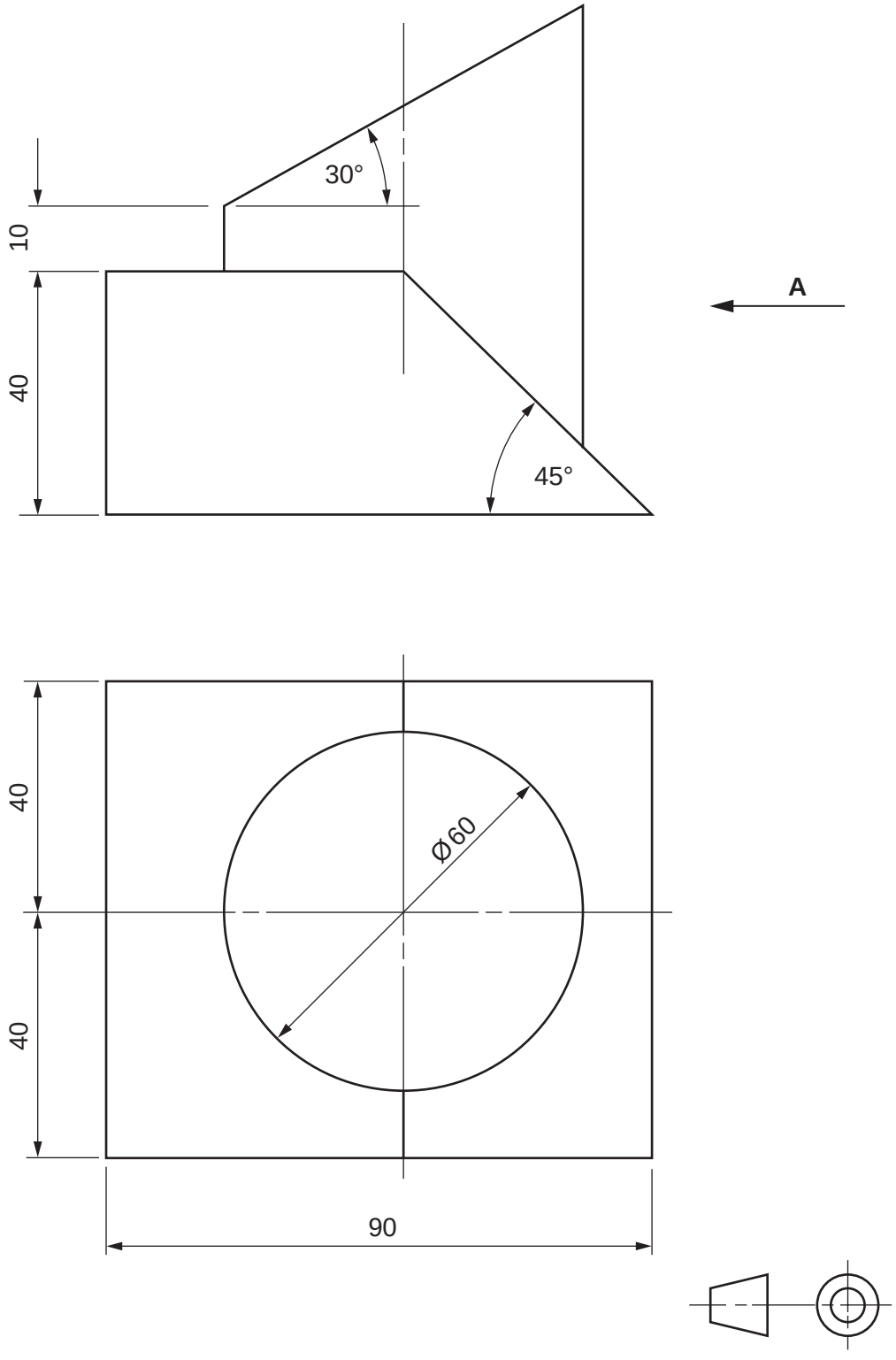


Fig. 5

6 Fig. 6 shows two views of a pivot block drawn in first angle projection.
Draw an isometric view of the pivot block with **C** the lowest point in the view.
Do not use an isometric scale or show any hidden detail. [20]

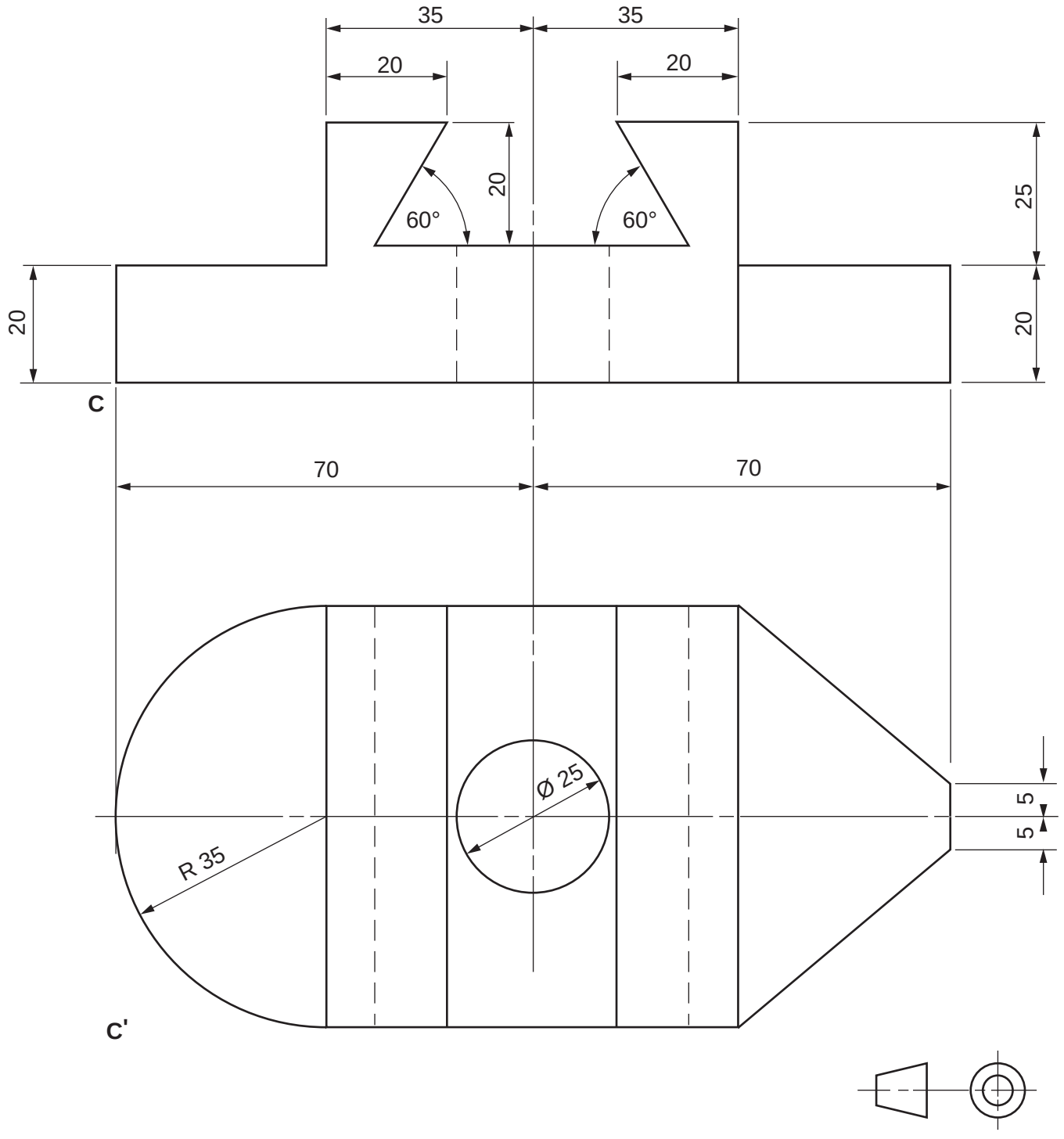


Fig. 6

7 Fig. 7 shows two views, drawn in first angle projection, of a quadrilateral plate that has been folded along AB to form two triangles.

(a) Draw the two given views. [4]

(b) **(i)** Determine the true lengths of the sides of the quadrilateral. [8]

(ii) Draw the shape of the plate prior to folding. [4]

(c) By construction determine the true angle through which the plate has been folded to give the shape drawn. [4]

Ignore the thickness of the material.

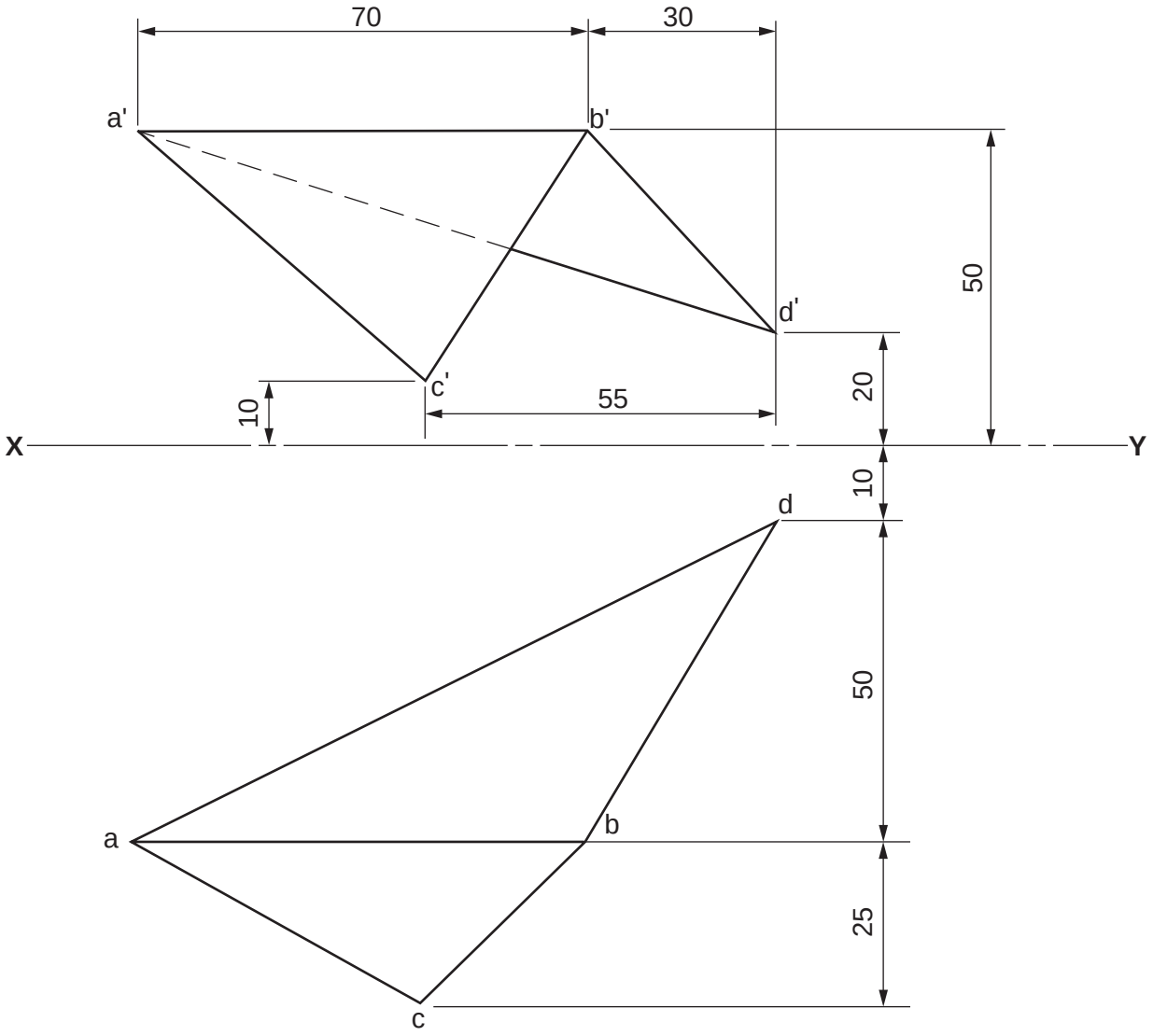


Fig. 7

8 Fig. 8 represents a clear plastic cone around which a fine line has been cut, with a constant pitch, on its outer surface. It commences at point **X** and terminates at point **A**, having completed 1½ turns of the helix.

(a) Draw the given views. [2]

(b) Construct the path of this fine line:

(i) on the front elevation; [10]

(ii) on the plan. [8]

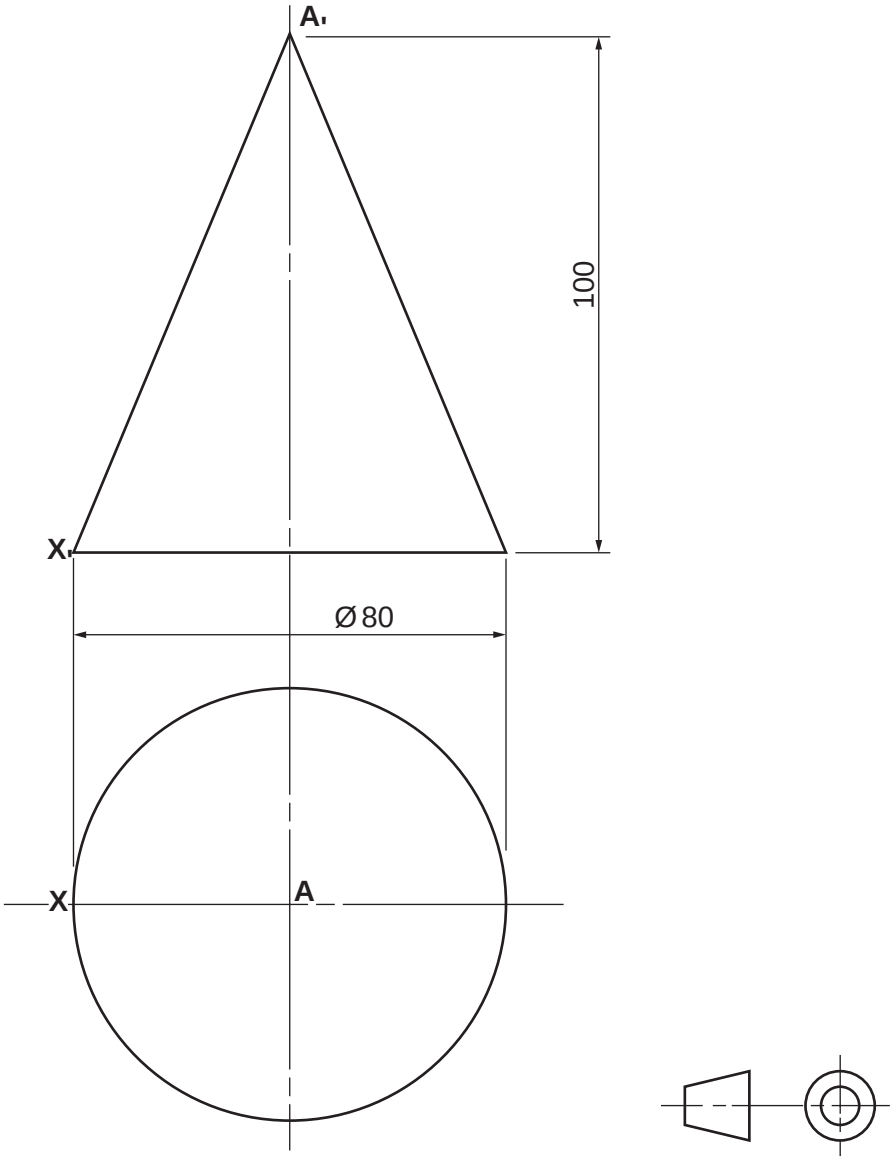


Fig. 8

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