



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

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**GEOMETRICAL AND MECHANICAL DRAWING**

**7040/01**

Paper 1

**October/November 2008**

**2 hours 40 minutes**

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

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**READ THESE INSTRUCTIONS FIRST**

Write 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  $30^\circ$ ,  $45^\circ$  or  $60^\circ$  to other lines may be drawn without showing construction lines.

All dimensions are in millimetres unless otherwise stated.

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.

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This document consists of **8** printed pages.



\* 7 3 3 0 8 1 7 6 9 9 \*

## Section 1 Plane Geometry

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

- 1 The elevation of a catch plate is shown in Fig. 1.

Draw, full size, the catch plate, showing clearly the constructions used to determine the centres of the various arcs and the semi-ellipse **ABC**.

Construct a tangent to the ellipse at point **P**.

[20]

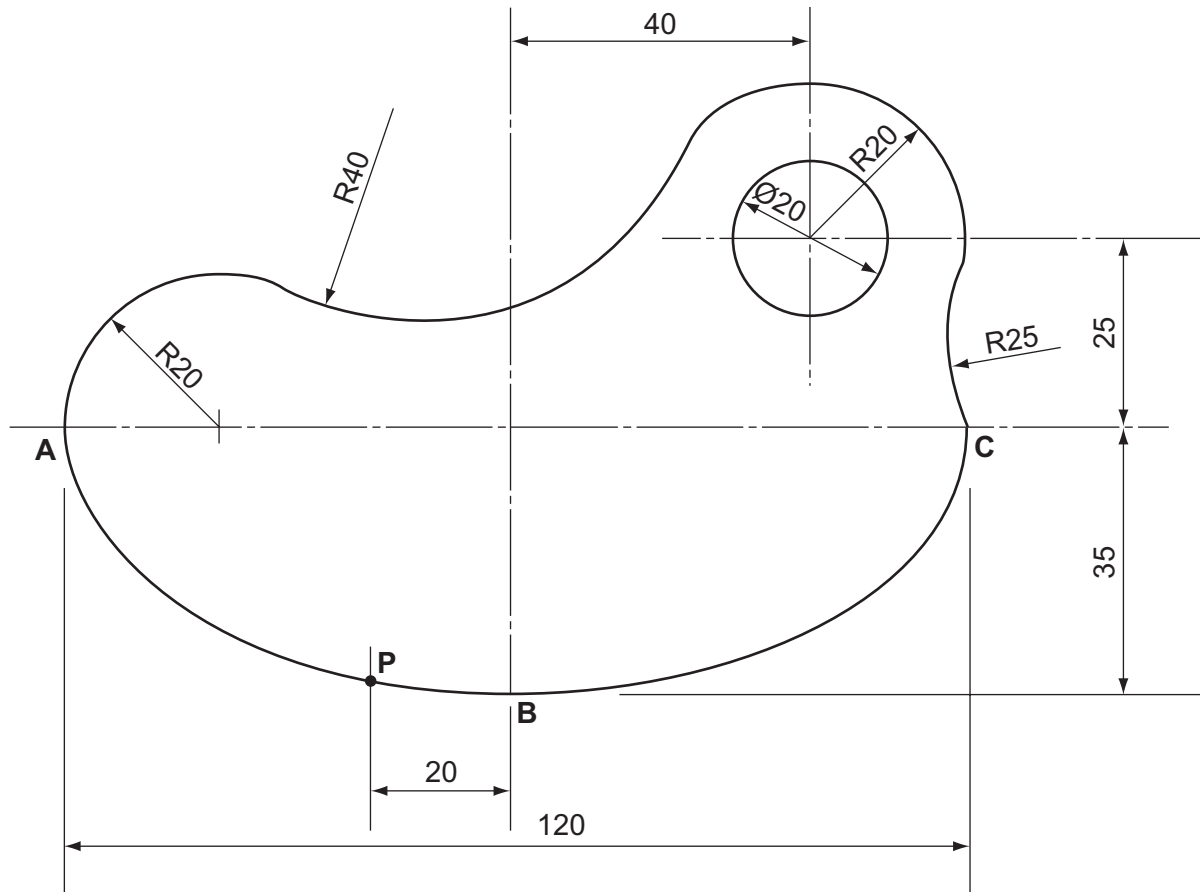


Fig. 1

- 2 Fig. 2 shows crank **OA** and a lever **CB** connected by a rigid link **AB**, with pin joints at **A** and **B**. The crank **OA** rotates clockwise about the fixed centre **O**, whilst **CB** oscillates about the fixed centre **C**.

Draw the locus of point **P**, for one complete revolution of crank **OA**.

[20]

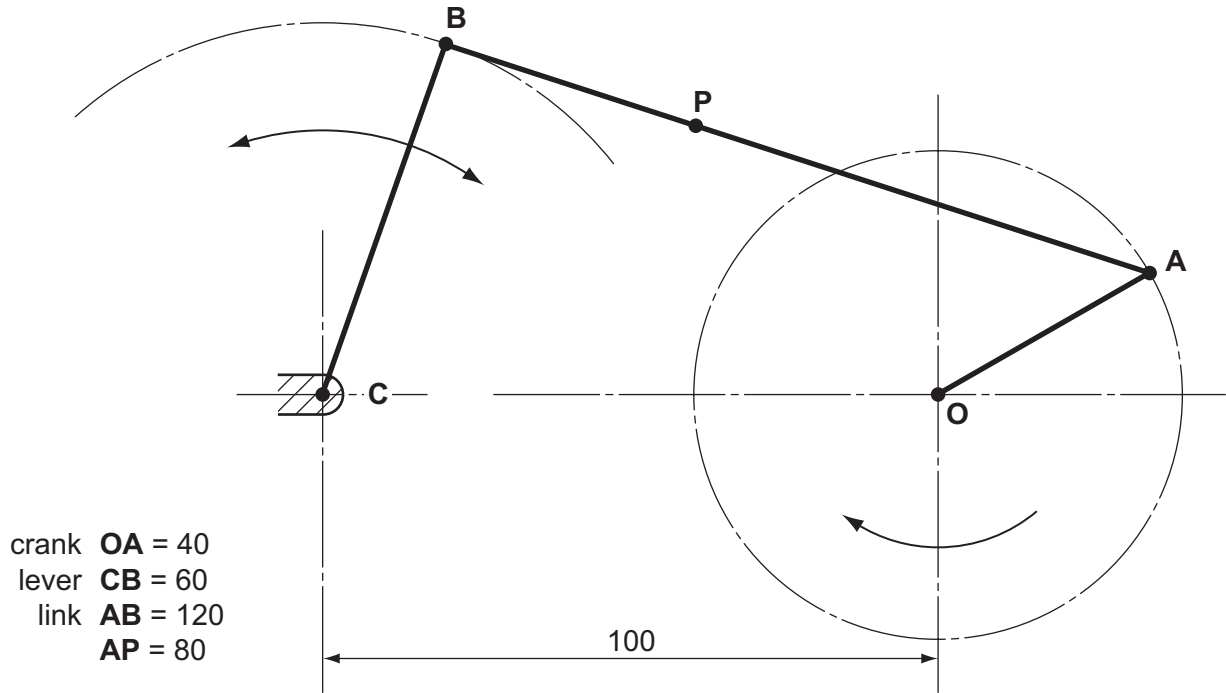


Fig. 2

3 Fig. 3 shows a view of a sheet-metal plate.

(a) Draw the given view. Measure and state the length of the side **DE**. [11]

(b) Construct a similar figure, having the ratio of its sides equal to  $\frac{4}{7}$  of those in Fig. 3. [9]

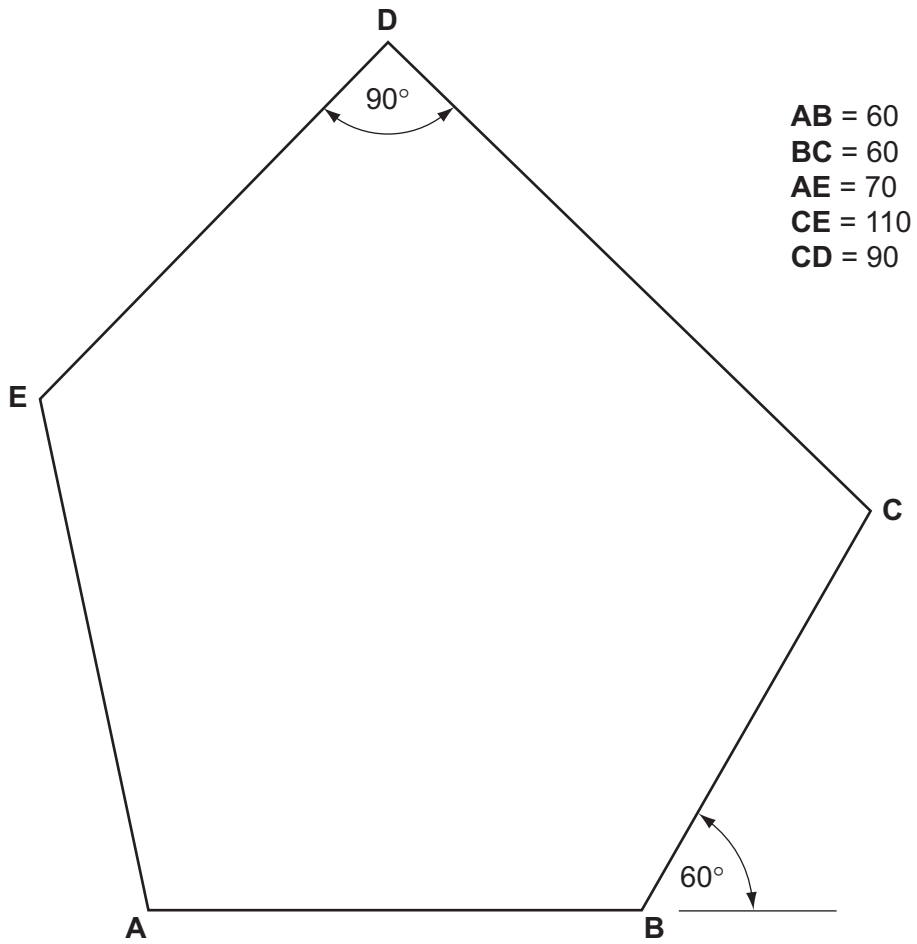


Fig. 3

**Section 2 Solid Geometry**

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

4 Fig. 4 shows three views of a casting drawn in first angle projection.

Draw an isometric view of this casting with **P** the lowest point in the view.

Do not use an isometric scale or show any hidden detail.

[20]

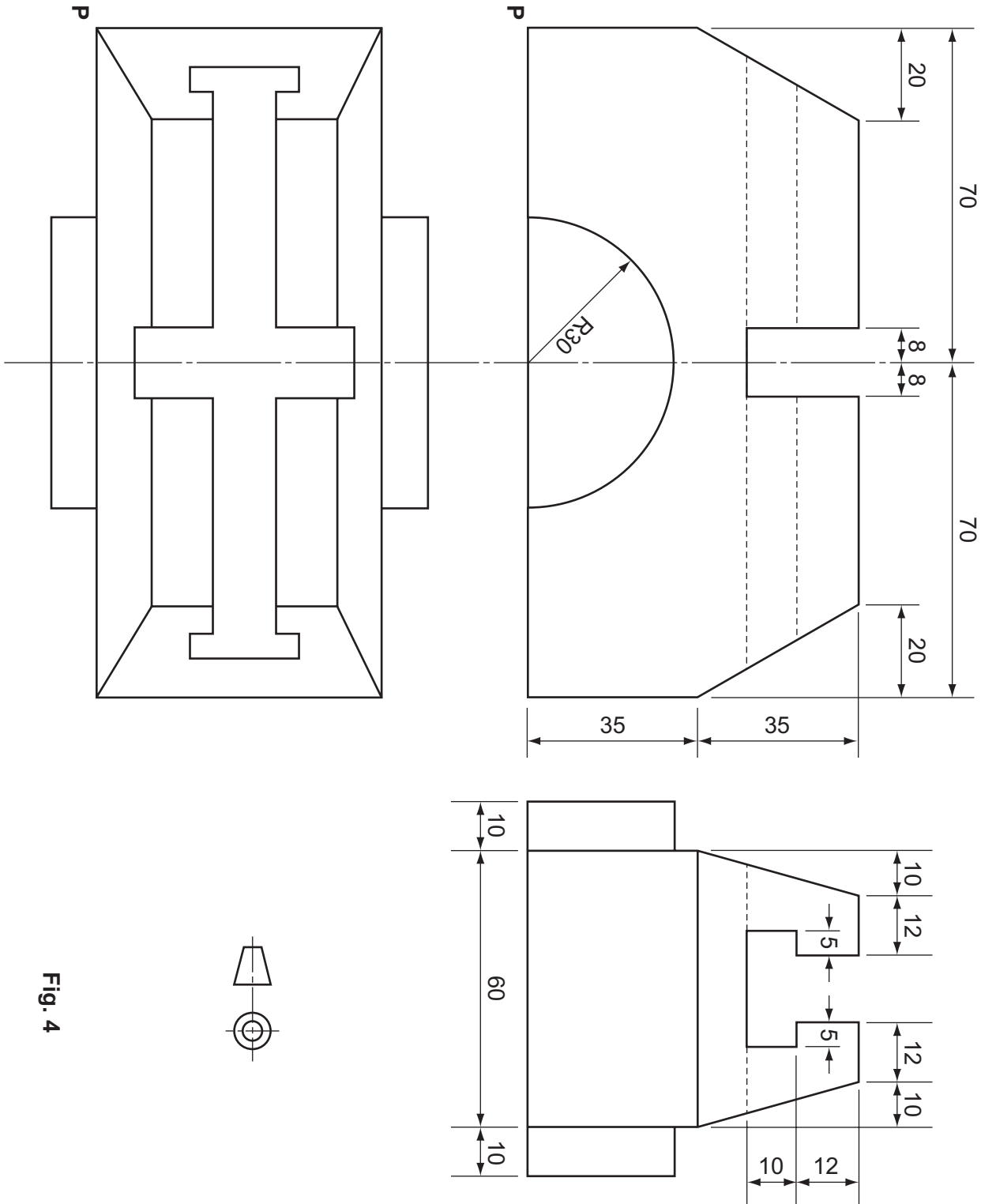


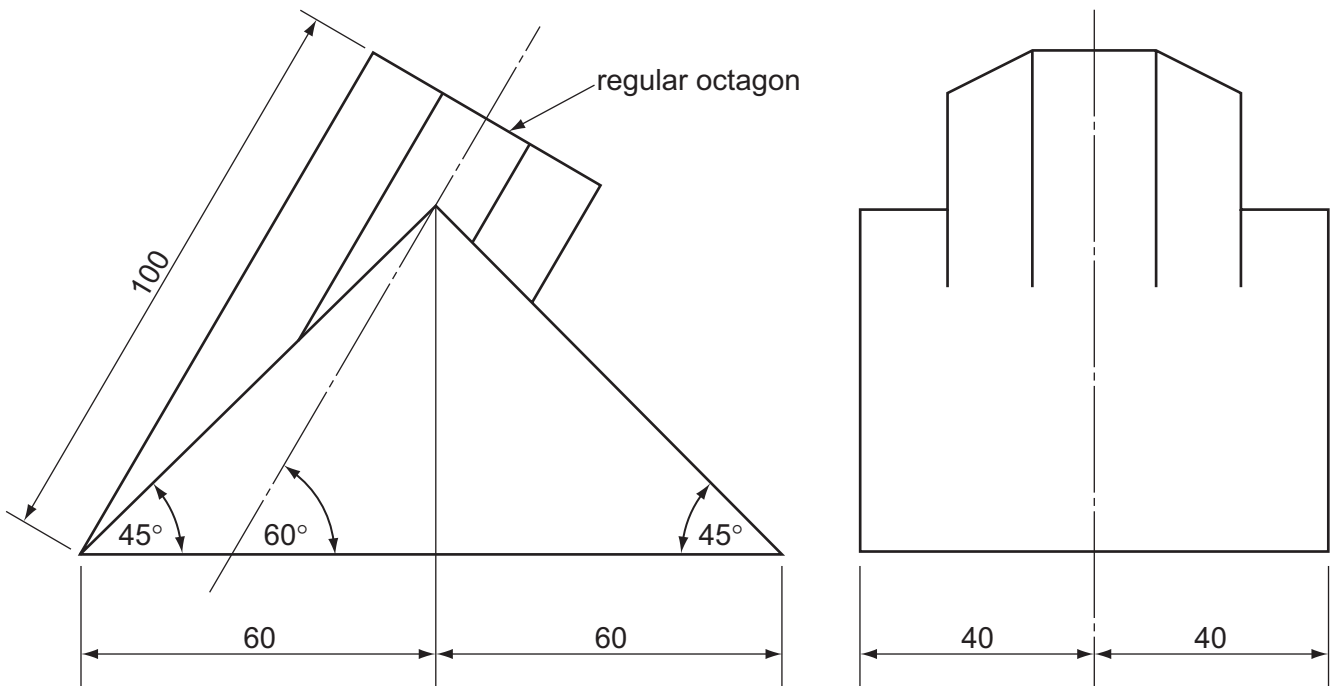
Fig. 4

- 5 Fig. 5 shows the elevation and incomplete end view of a triangular prism intersected by a regular octagonal prism.

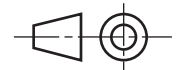
Draw:

- (a) the given elevation; [6]  
 (b) the complete end view; [4]  
 (c) a plan view projected from (a); [4]  
 (d) the development of the surface area of the octagonal prism. [6]

**Hidden detail is not required in any view.**



**Fig. 5**



- 6 A right-handed helical spring is made from a square steel bar 15 mm square.

The outside diameter of the spring is 90 mm and it has a pitch of 90 mm.

Draw  $1\frac{1}{2}$  turns of the spring.

[20]

**Hidden detail is not required in any view.**

7 Fig. 6 shows two incomplete views of the junction of two offset cylindrical pipes.

(a) Draw the given views. [3]

(b) Complete the front elevation showing the curves of intersection. Include all hidden detail. [11]

(c) Complete the end elevation. [6]

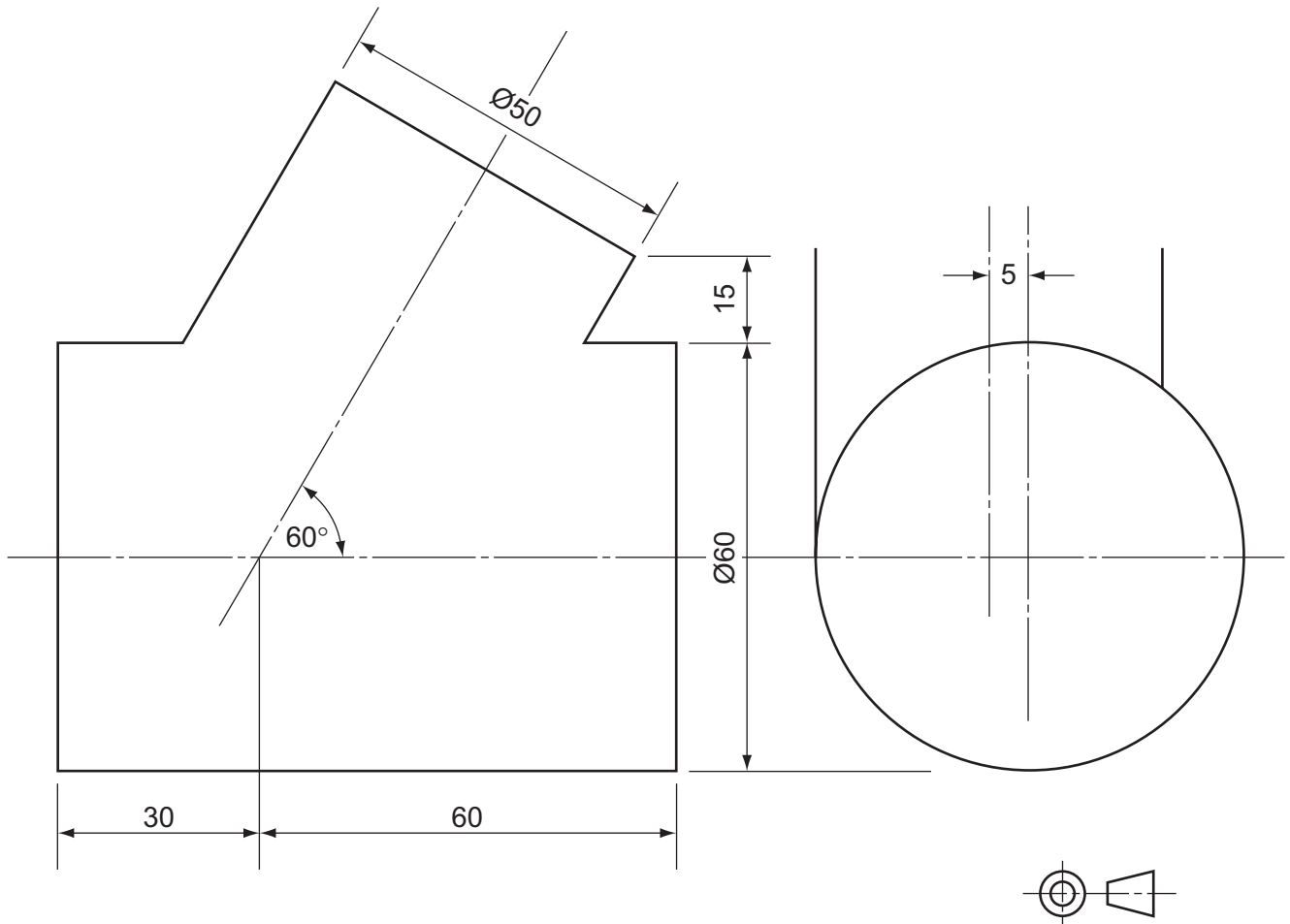


Fig. 6

8 Fig. 7 shows the elevation and incomplete plan of a right circular cone which is cut by a plane **X–X** lying parallel to the generator.

(a) Draw the given views. [2]

(b) Draw the following views of the part of the cone below the cutting plane;

(i) an end elevation projected from view (a) looking in the direction of arrow **A**; [6]

(ii) a complete plan view looking in the direction of arrow **B**. [6]

(c) Draw the true shape of the cut face. [6]

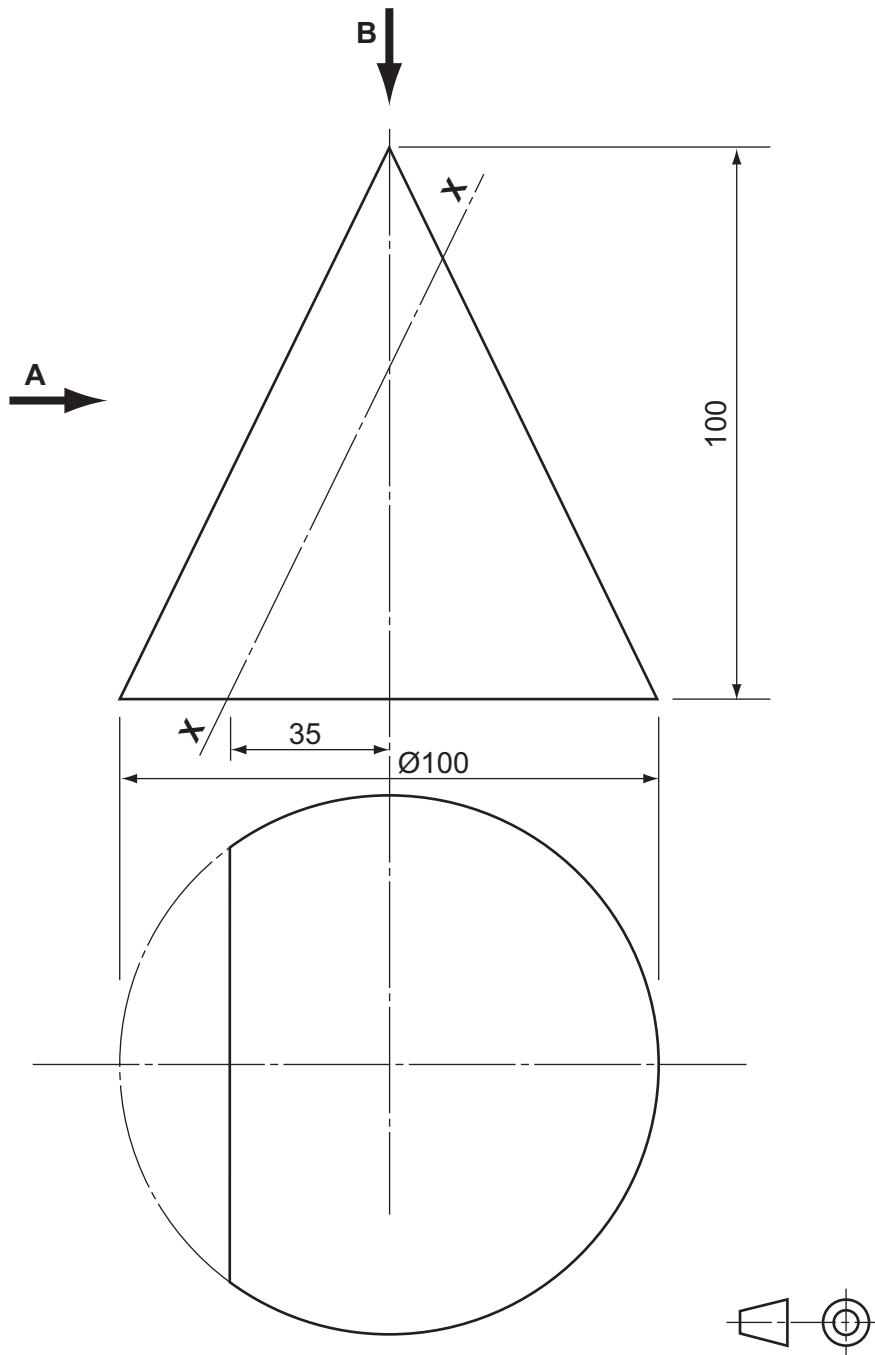


Fig. 7