

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**Joint Examination for the School Certificate  
and General Certificate of Education Ordinary Level**

**GEOMETRICAL AND MECHANICAL DRAWING 7040/1  
PAPER 1**

**OCTOBER/NOVEMBER SESSION 2002**

2 hours 40 minutes

Additional materials:

A2 drawing paper (1 sheet)  
Standard drawing equipment

**TIME** 2 hours 40 minutes

**INSTRUCTIONS TO CANDIDATES**

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

Use both sides of the drawing paper for your answers.

**INFORMATION FOR CANDIDATES**

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.

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**This question paper consists of 7 printed pages and 1 blank page.**



## Section 1 Plane Geometry

- 1 (a) Construct a pentagon with sides 45 mm long. [7]
- (b) By construction reduce the pentagon to a rectangle of equal area. [7]
- (c) Construct from (b) a square equal in area to the rectangle. [5]
- (d) Measure and state the size of the square. [1]
- 2 Fig. 1 shows the view of a cam. [20]

Construct full size, the given view. Clearly show the methods of construction for all the centres of radii, and the points of tangency.

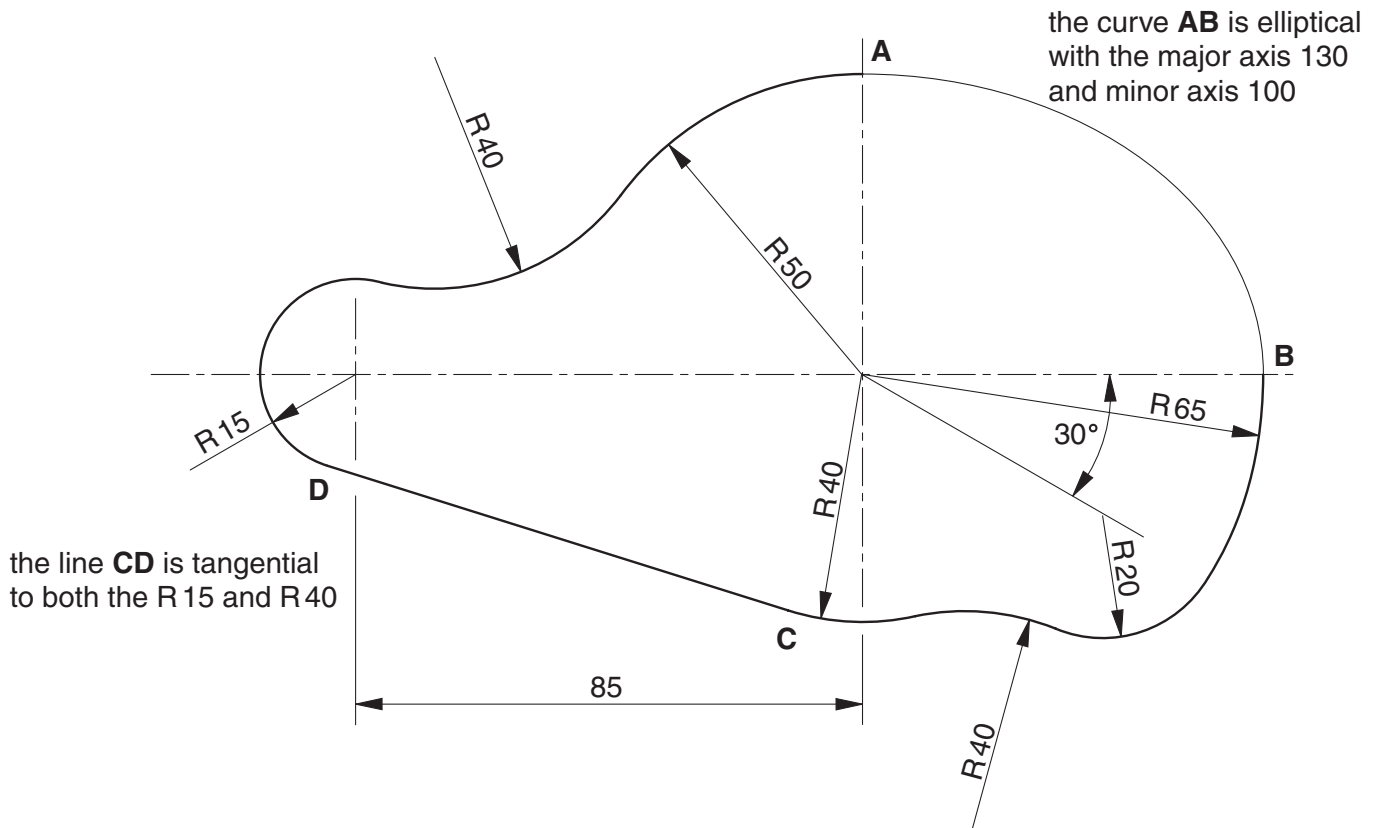


Fig. 1

- 3 (a) Construct the curve generated by a point on the circumference of a 50 mm diameter circle, as it rolls without slipping for one complete revolution about the outer periphery of a circle of 60 mm diameter. [18]
- (b) Name the curve generated. [2]

### Section 2 Solid Geometry

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

- 4 Fig. 2 shows two views of a bearing drawn in first angle projection.

Draw an isometric view of the bearing with **X** being the lowest point in the view.

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

[20]

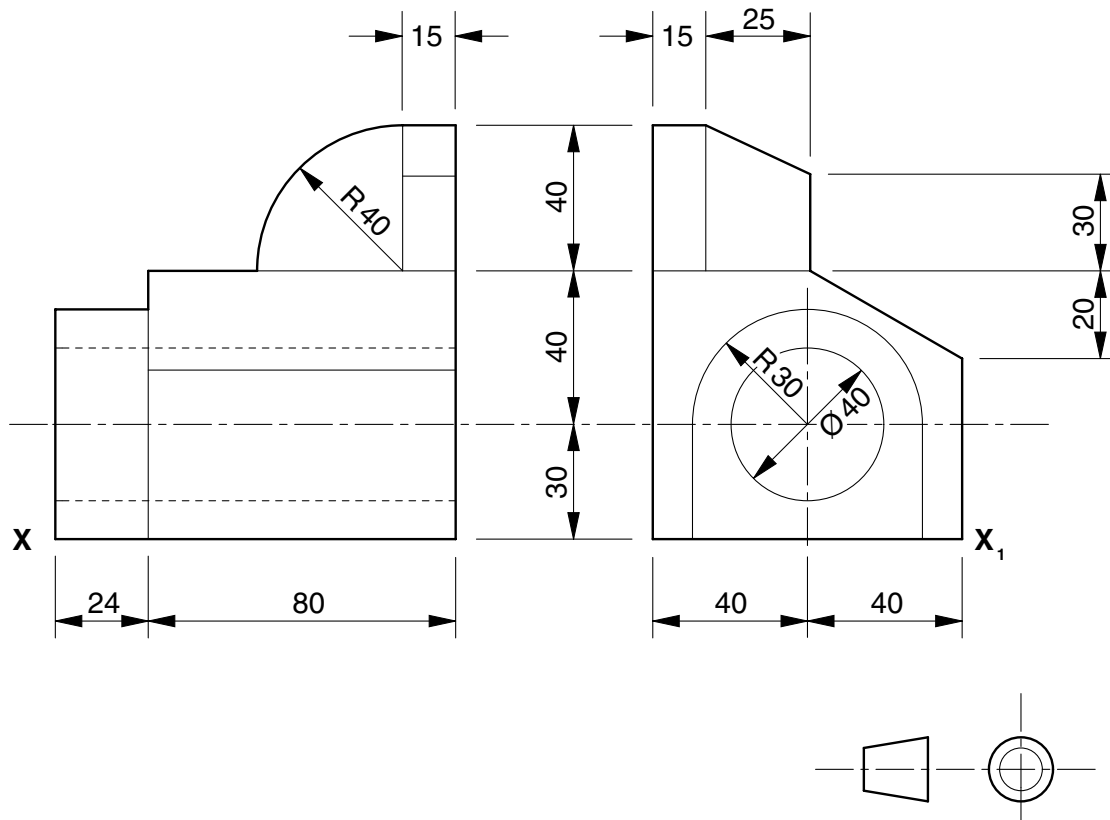


Fig. 2

- 5 Fig. 3 shows the elevation and incomplete end elevation of a prism intersected by a right regular octagonal prism measuring 40 mm across the flats.

Draw:

- (a) the given elevation; [4]  
 (b) the complete end view showing all hidden details; [6]  
 (c) a plan view projected from (a); [5]  
 (d) the development of the surface area of the octagonal prism. [5]

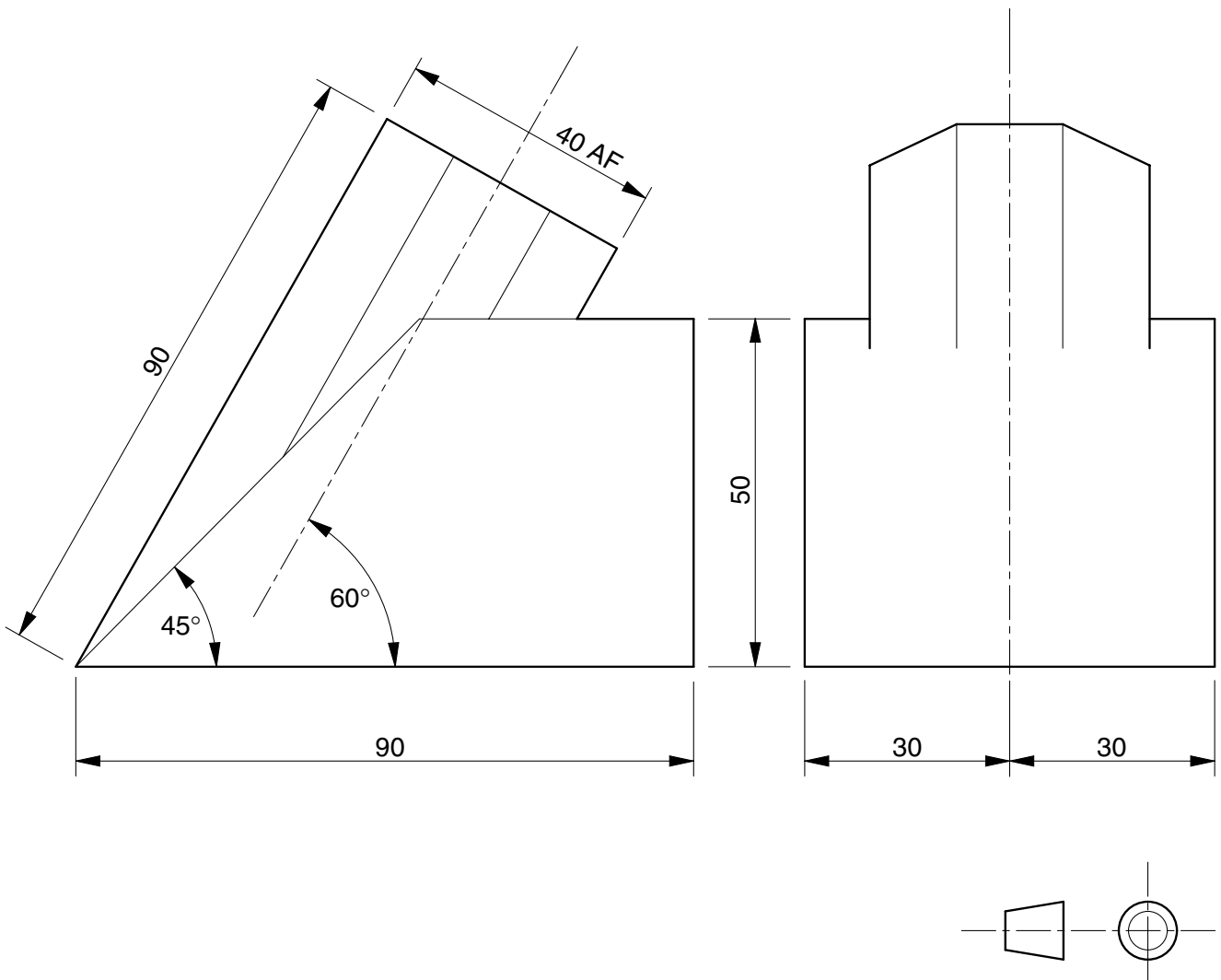


Fig. 3

6 Fig. 4 shows the elevation and incomplete plan of a right circular cone which is cut by a plane lying parallel to the generator.

(a) Draw the given elevation. [1]

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

(i) an end elevation projected from (a) and looking in the direction of arrow 'X'; [7]

(ii) the plan view. [6]

(c) Determine the true shape of the cut face. [5]

(d) Name the curve generated. [1]

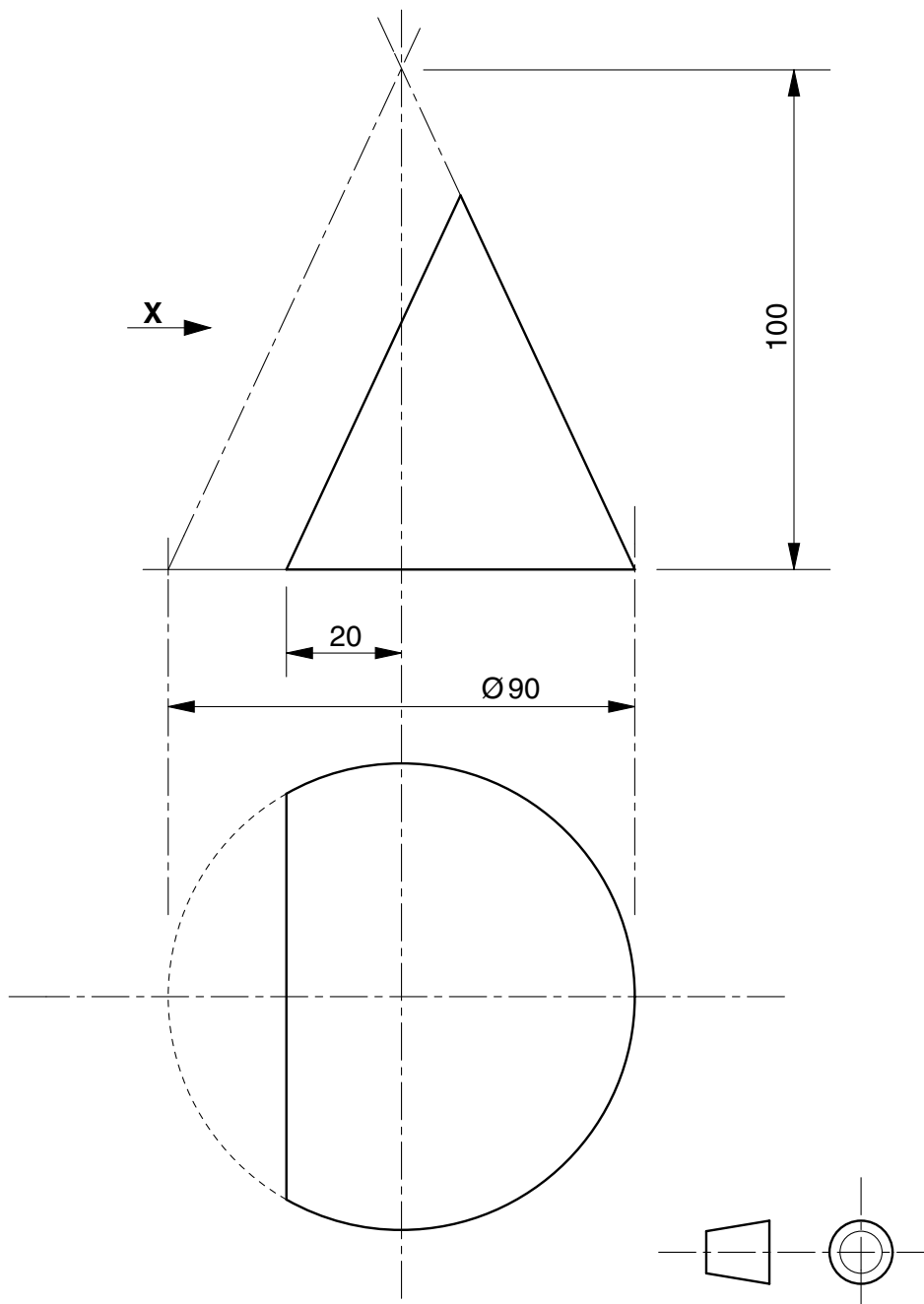


Fig. 4

7 Fig. 5 shows the front elevation and plan of a support bracket, drawn in first angle projection.

- (a) Draw the given views. [4]
- (b) Project an auxiliary elevation viewed in the direction of arrow **A** on the ground line  $X_1 Y_1$  at  $60^\circ$  to the  $X Y$  line. [8]
- (c) From (b) project a second auxiliary plan on the ground line  $X_2 Y_2$  which lies parallel to the  $X Y$  line. [8]

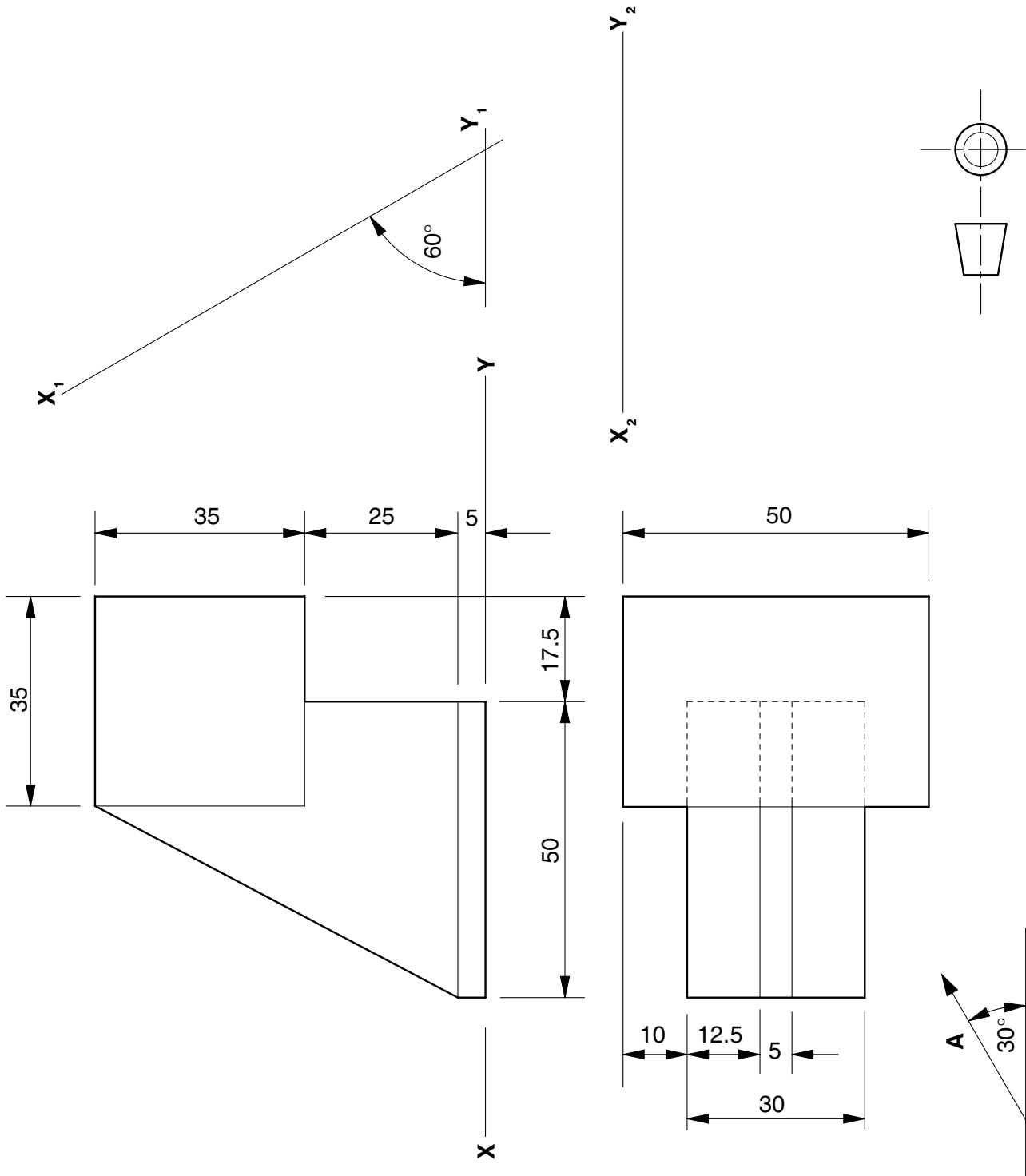


Fig. 5

8 Fig. 6 shows a thin metal plate, positioned as shown relative to the horizontal and vertical planes.

(a) Draw the given views. [4]

(b) Draw an end view. [4]

(c) Determine the true lengths of the sides AB, BC and AC, and hence draw the true shape of the plate. [8]

(d) Determine and state the true distance of the mid-point of the plate from the X-Y line. [4]

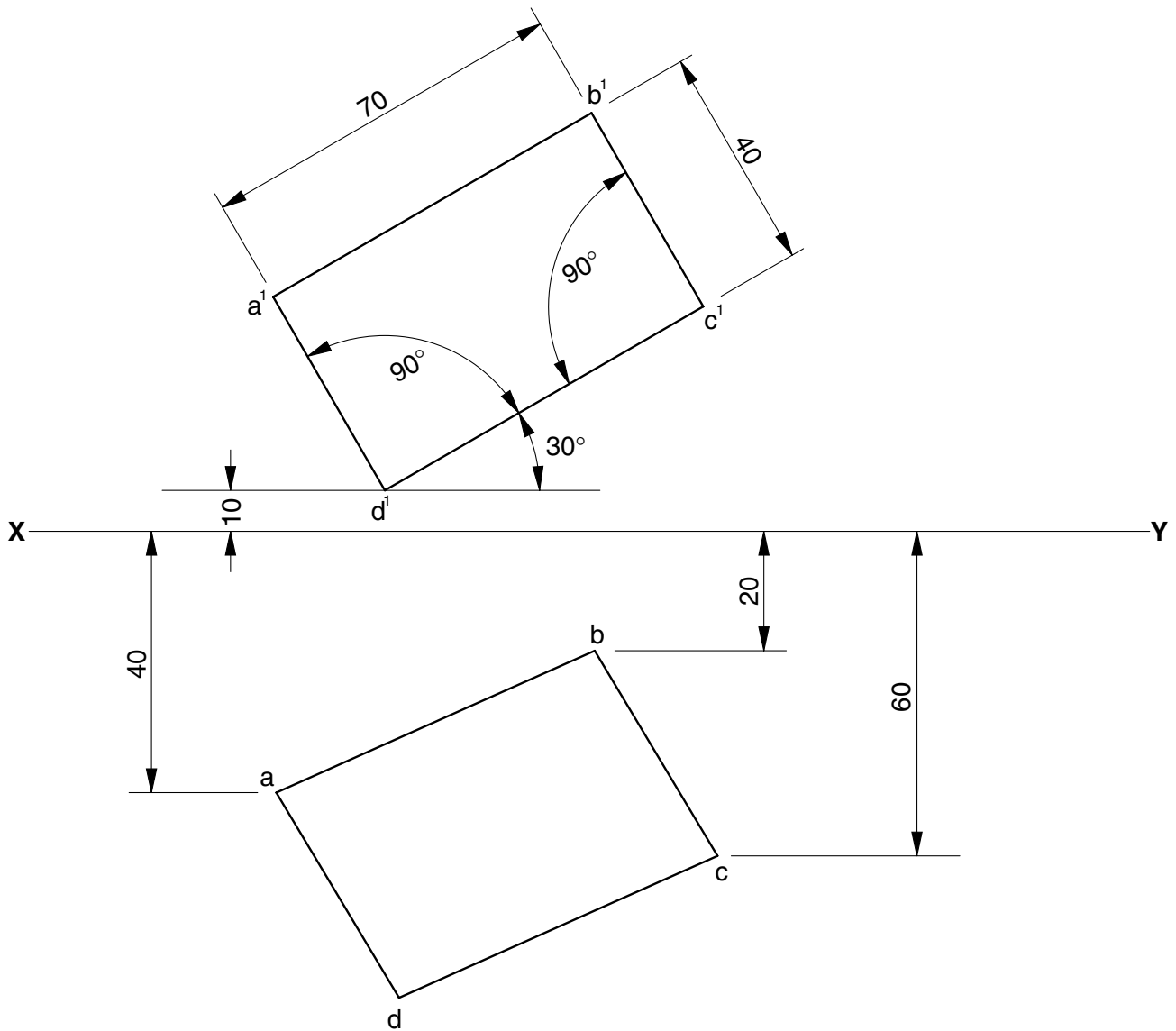


Fig. 6

