AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION, 2001

TECHNICAL DRAWING – ORDINARY LEVEL – PAPER I

PLANE AND SOLID GEOMETRY

THURSDAY, 14 JUNE — AFTERNOON 2.00 p.m. to 5.0 p.m.

(200 MARKS)

INSTRUCTIONS

(a) Answer **four** questions.
(b) All questions carry equal marks.
(c) Construction lines must be shown on all solutions.
(d) Write the number of the question, distinctly, on the answer paper.
(e) First or third angle projection may be used.
(f) All dimensions are given in millimetres.

1. An isometric view of a shaped solid is shown in Fig. 1.

   (a) Draw an elevation of the solid looking in the direction of the arrow.

   (b) Project a plan from the elevation.

   (c) Project a new elevation of the solid from the plan, which will show the true shape of the surface A.
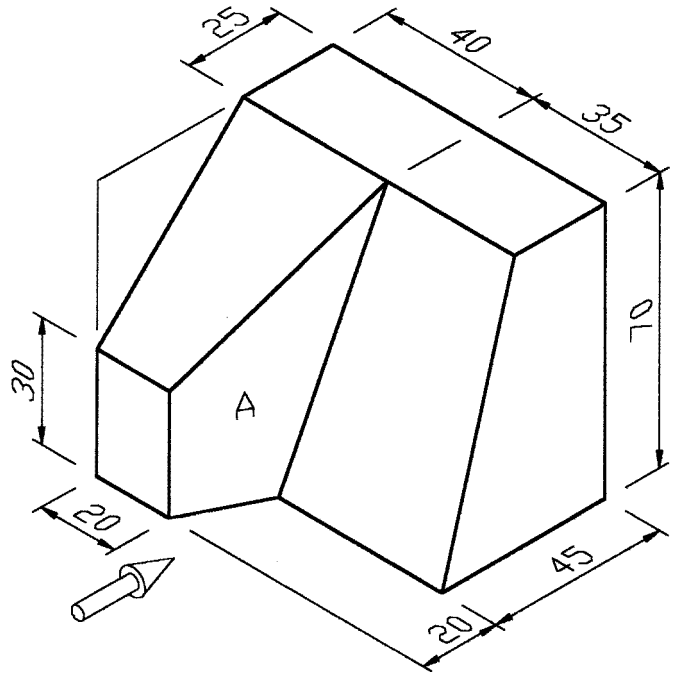
Fig. 1

2. Fig. 2 shows a quadrilateral ABCD. The sides of the triangles ABC and ACD are in a ratio of 3:5:6.

   (a) Draw the quadrilateral showing clearly how the points B and D are obtained.

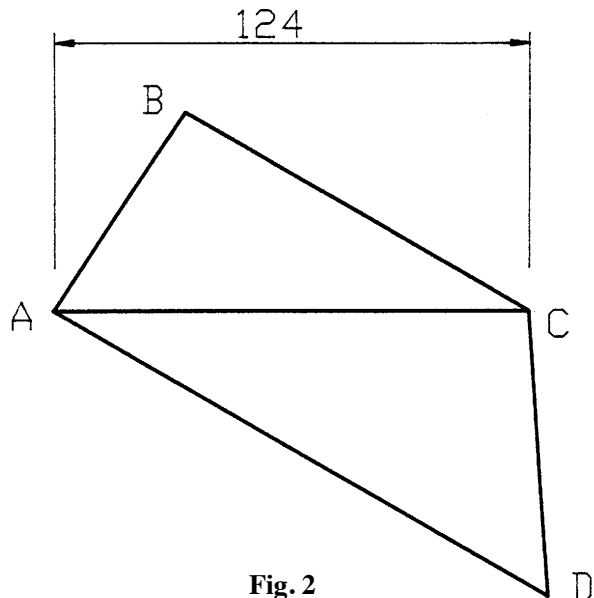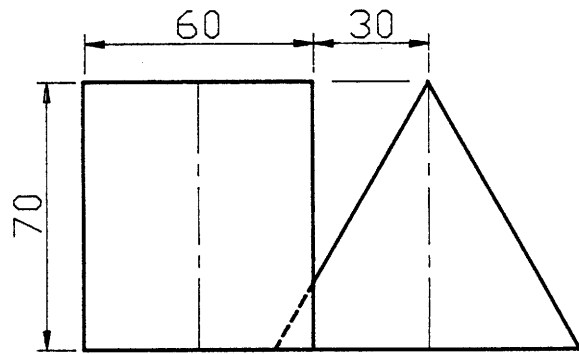   **(b)** Draw a square which shall have the same area as the quadrilateral ABCD.

Fig. 2

3. Fig. 3 shows the elevation of a cone and cylinder which are in contact with each other. The plan of the cone is also shown with a point P on its surface.

    (a) Draw the plan and elevation of both solids and show the position of point P in elevation.

    (b) Draw the plan and elevation of a sphere having a diameter of 40 mm which shall be in contact with the cone at point P.
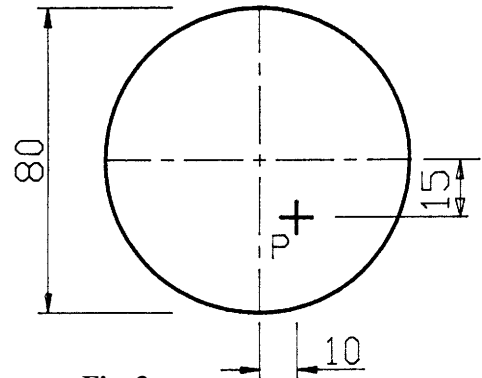
60   30

70

80

15

P

10

Fig. 3

4. Fig. 4 shows a circle C which rolls clockwise along the line AB for one complete revolution.

    (a) Draw the locus of point P on the circle for this movement.

    (b) Draw one convolution of an archimedian spiral when the shortest radius is 20 mm and the longest radius is 75 mm.
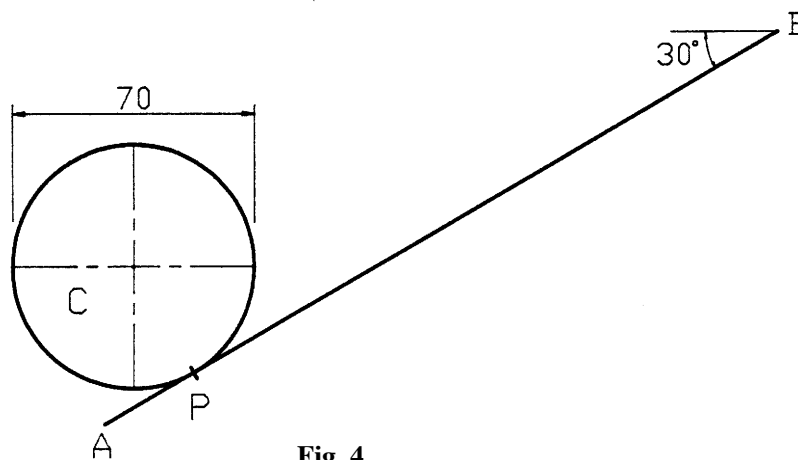
70

B

30°

C

P

A

Fig. 4

5. The elevation and plan of a solid which is cut by an oblique plane VTH are shown in Fig. 5.

(a) Draw the plan and elevation of the solid when it is cut by the oblique plane VTH.

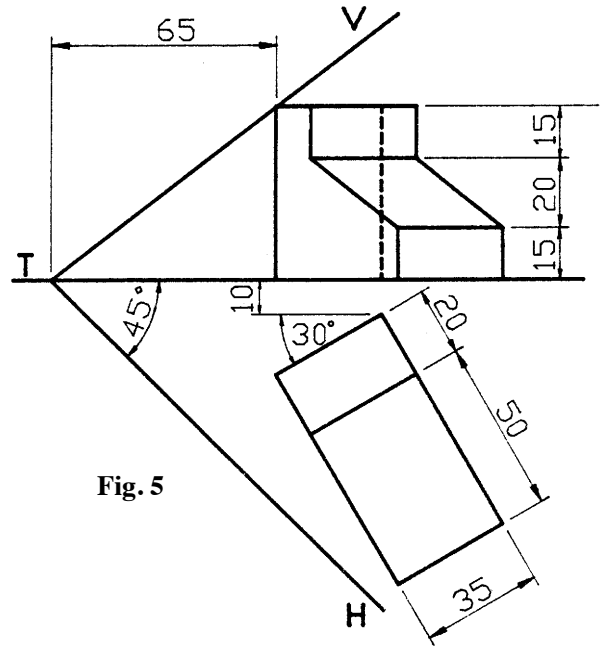**(b)** Draw the true shape of the cut surface of the solid.

Fig. 5

6. **(a)** In an ellipse the major axis is 130 mm and the minor axis is 94 mm. Draw the ellipse. Draw a tangent to the curve at a point 40 mm from the minor axis.

(b) Fig. 6 shows the focus of a parabola and the direction of the axis. The position of a point P on the curve is also shown. Show how the directrix and vertex are located and draw a portion of the curve to include point P.
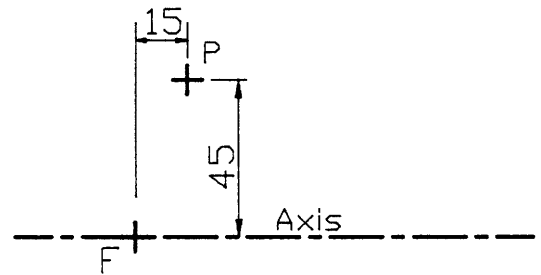
Fig. 6

7. Fig. 7 shows the incomplete plan and elevation of a solid which is intersected by a triangular prism.

Draw the plan, elevation and end view of the solids showing all lines of interpenetration.
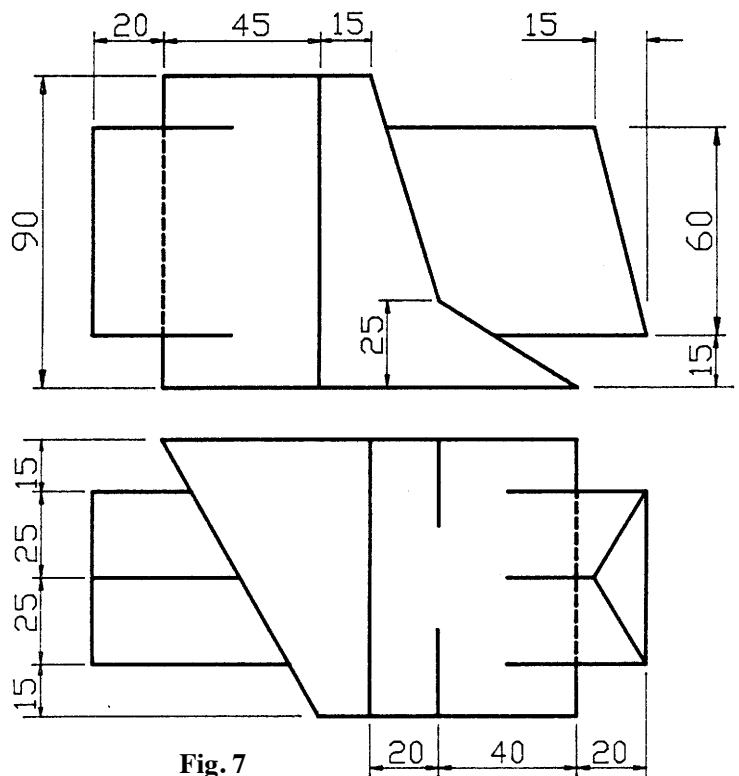
Fig. 7