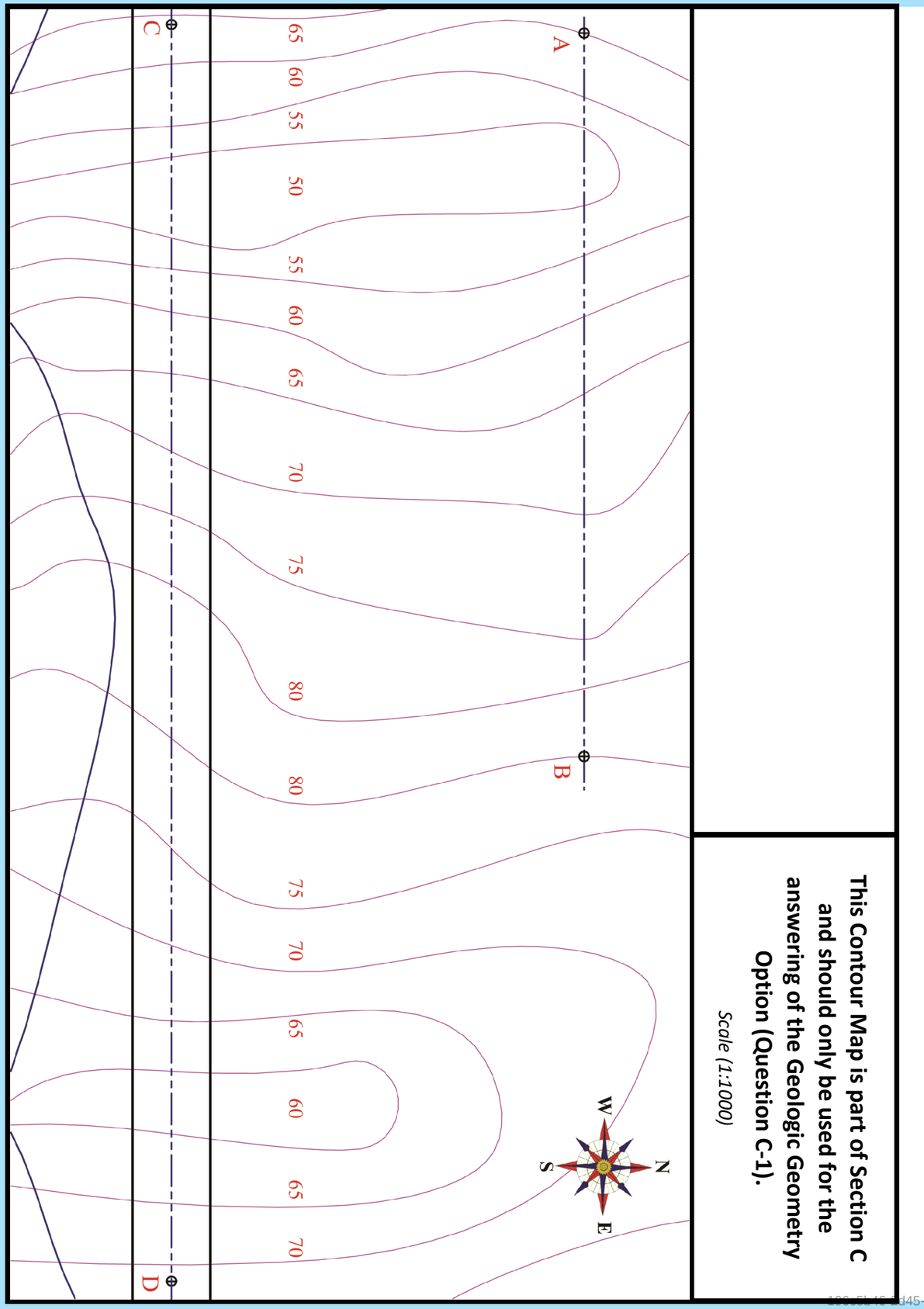


This Contour Map is part of Section C and should only be used for the answering of the Geologic Geometry Option (Question C-1).

Scale (1:1000)

L.84A

Pre-Leaving Certificate Examination, 2020

Design & Communication Graphics

Ordinary Level

Section A (60 marks)

Time: 3 Hours

This examination is divided into three sections:

SECTION A	(Core - Short Questions)
SECTION B	(Core - Long Questions)
SECTION C	(Applied Graphics - Long Questions)

SECTION A
- Four questions are presented.
- Answer **any three** on the A3 sheet overleaf.
- All questions in Section A carry **20 marks** each.

SECTION B
- Three questions are presented.
- Answer **any two** on drawing paper.
- All questions in Section B carry **45 marks** each.

SECTION C
- Five questions are presented.
- Answer **any two** (i.e. the options you have studied) on drawing paper.
- All questions in Section C carry **45 marks** each.

General Instructions:
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Name, School's Name and Teacher's Name in the box below and on all other sheets used.*

Name:

School's Name:

Teacher's Name:

SECTION A - Core - Answer **any three** of the questions on this A3 sheet.

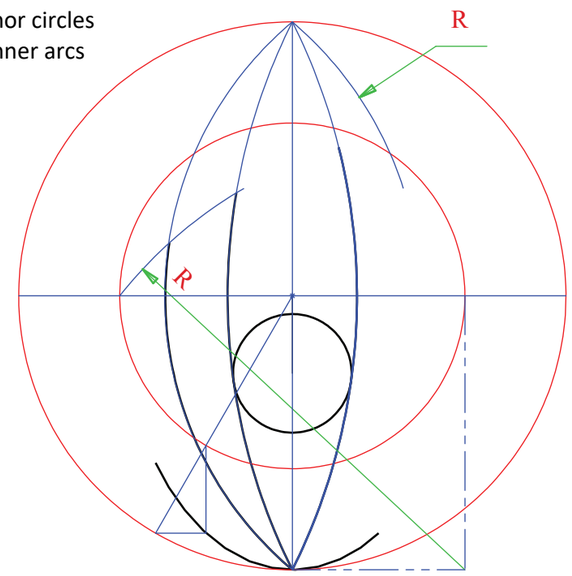
A-1. The graphic below shows a logo for the Rugby World Cup which took place in Japan.
It consists of an ellipse and a number of inner arcs.

The drawing on the right shows the major and minor circles for the ellipse. Portions of the ellipse and of the inner arcs are also shown.

(a) Locate the remaining points on the ellipse and draw the curve.

(b) Locate the focal points of the ellipse.

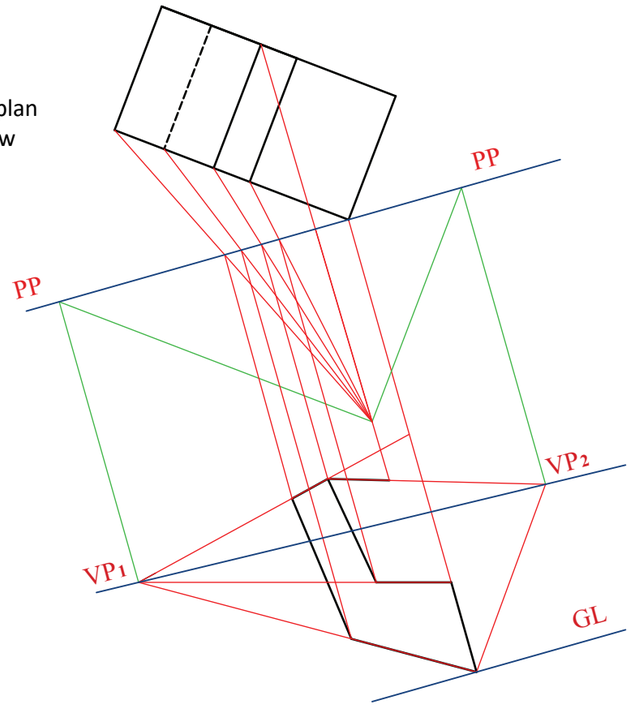
(c) Locate the centre point for the arc on the right and complete the drawing.



A-2. The image below shows a concrete garden feature.

The drawing on the right shows the partial plan and the partially completed perspective view of the garden feature.

Complete the perspective drawing.

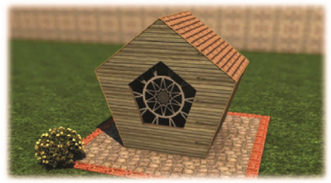


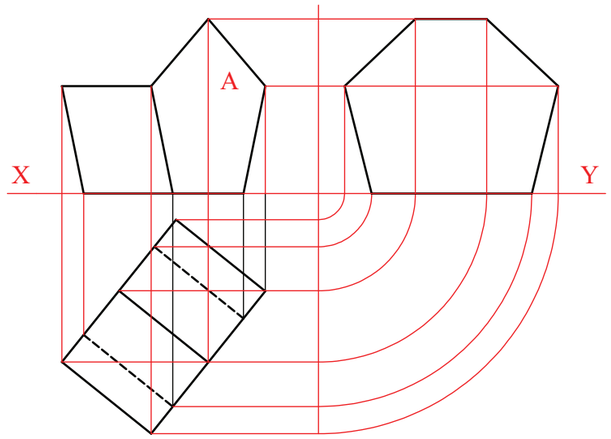
A-3. The 3D graphic below shows a garden decoration.
The decoration is pentagonal in cross-section.

The drawing on the right shows the plan, the incomplete elevation and the incomplete end view of a similar solid.

(a) Complete the elevation and the end view.

(b) Find the true shape of the pentagonal surface **A**.



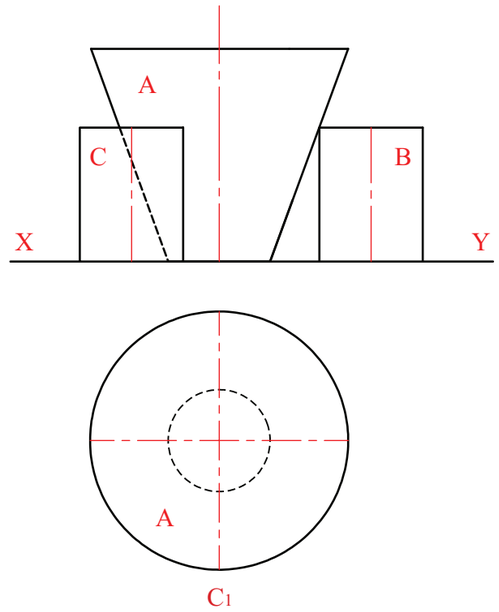


A-4. The 3D graphic below shows a conical table with a stool.

The drawing on the right shows the plan and the elevation of the truncated cone **A** which is positioned as shown. The elevations of cylinder **B** and cylinder **C** are also shown. Both are in contact with the truncated cone.

(a) Draw the plan of cylinder **B**.

(b) Draw the plan of cylinder **C**.



This examination paper must be returned at the end of the examination – You must include your Name, School Name and Teacher's Name on the front cover.

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Pre-Leaving Certificate Examination, 2020

Design & Communication Graphics
Ordinary Level
Sections B and C (180 marks)

Time: 3 Hours

This examination is divided into three sections:

SECTION A	(Core - Short Questions)
SECTION B	(Core - Long Questions)
SECTION C	(Applied Graphics - Long Questions)

SECTION A
- Four questions are presented.
- Answer **any three** on the accompanying A3 examination paper.
- All questions in Section A carry **20 marks** each.

SECTION B
- Three questions are presented.
- Answer **any two** on drawing paper.
- All questions in Section B carry **45 marks** each.

SECTION C
- Five questions are presented.
- Answer **any two** (i.e. the options you have studied) on drawing paper.
- All questions in Section C carry **45 marks** each.

General Instructions:
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *The graphics presented are not necessarily drawn to scale and must not be used for scaling purposes.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Name, School's Name and Teacher's Name in the box provided on section A and on all other sheets used.*

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SECTION B - Core

Answer **any two** questions from this section on drawing paper.

B-1. The graphic on the right shows a conservatory which has been added to the back of a house.

Fig. B-1 below shows an isometric view of a model of a similar structure.

(a) Draw the plan of the structure.

(b) Project an elevation from the plan looking in the direction of the arrow.

(c) Draw an auxiliary elevation of the structure, projected from the plan, which will include the true shape of surface **A**.

Scale 1:1

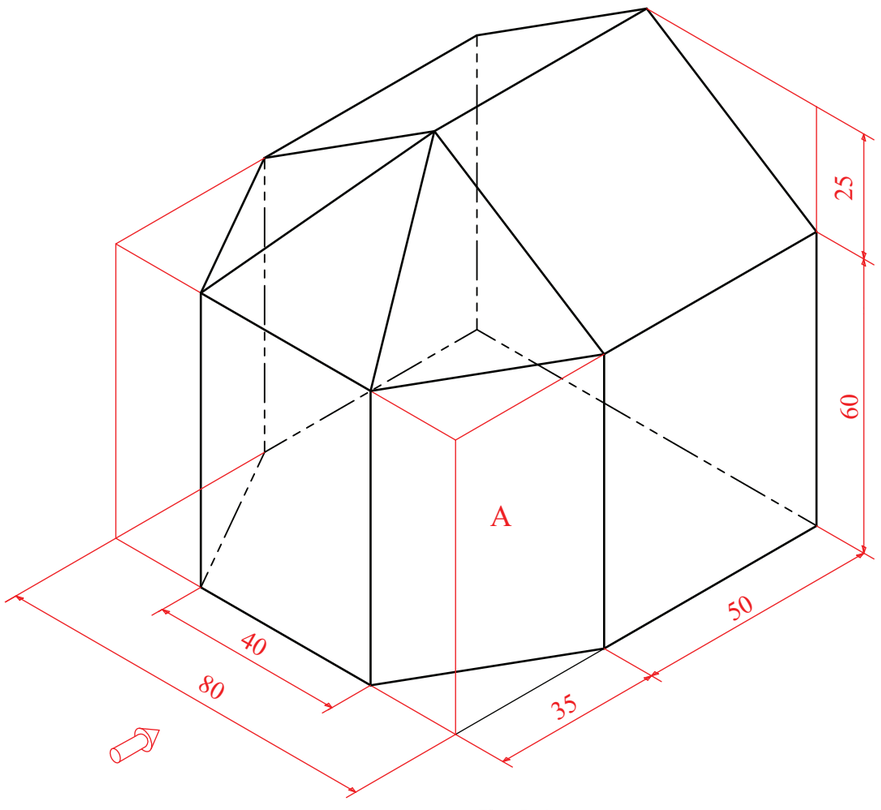

Fig. B-1

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B-2. The graphic on the right shows a perfume bottle.

Fig. B-2 below shows an incomplete isometric projection of a similar perfume bottle.

The elevation and plan of the perfume bottle are also shown in the required positions.

(a) Draw the given equilateral triangle **abc** and the axonometric axes **X**, **Y** and **Z**.

(b) Draw the elevation and plan positioned as shown.

(c) Draw the axonometric projection of the main body of the bottle.

(d) Draw the axonometric projection of the cylindrical lid of the bottle.

Scale 1:1

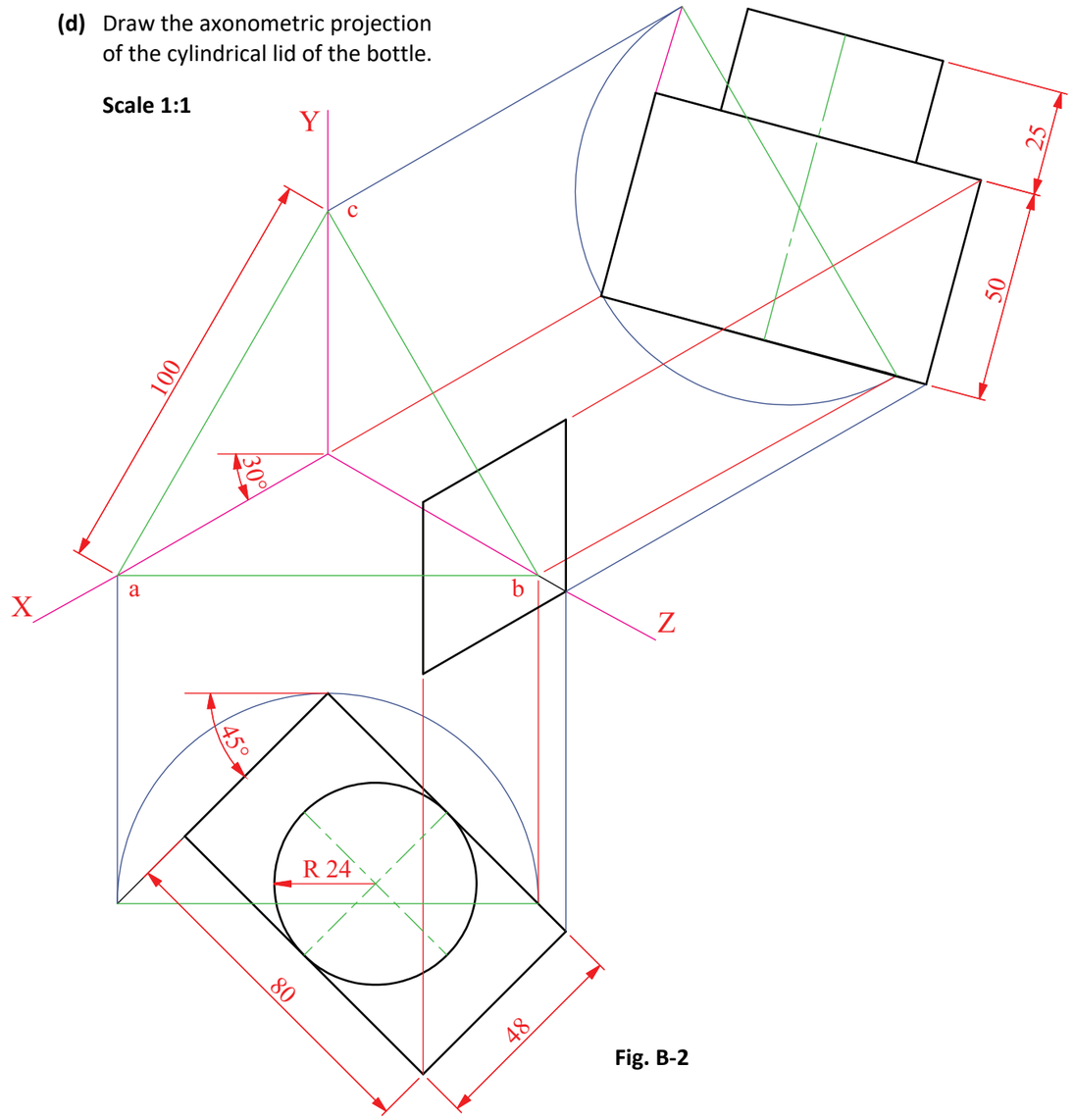


Fig. B-2

B-3. The image on the right shows a portion of a garden fence. It consists of vertical poles with three horizontal rails.

Fig. B-3 below shows the elevation and plan of a similar vertical pole and triangular rail which intersect.

(a) Draw the given plan and elevation showing all lines of interpenetration.

(b) Project an end view of the pole and rail.

Scale 1:1

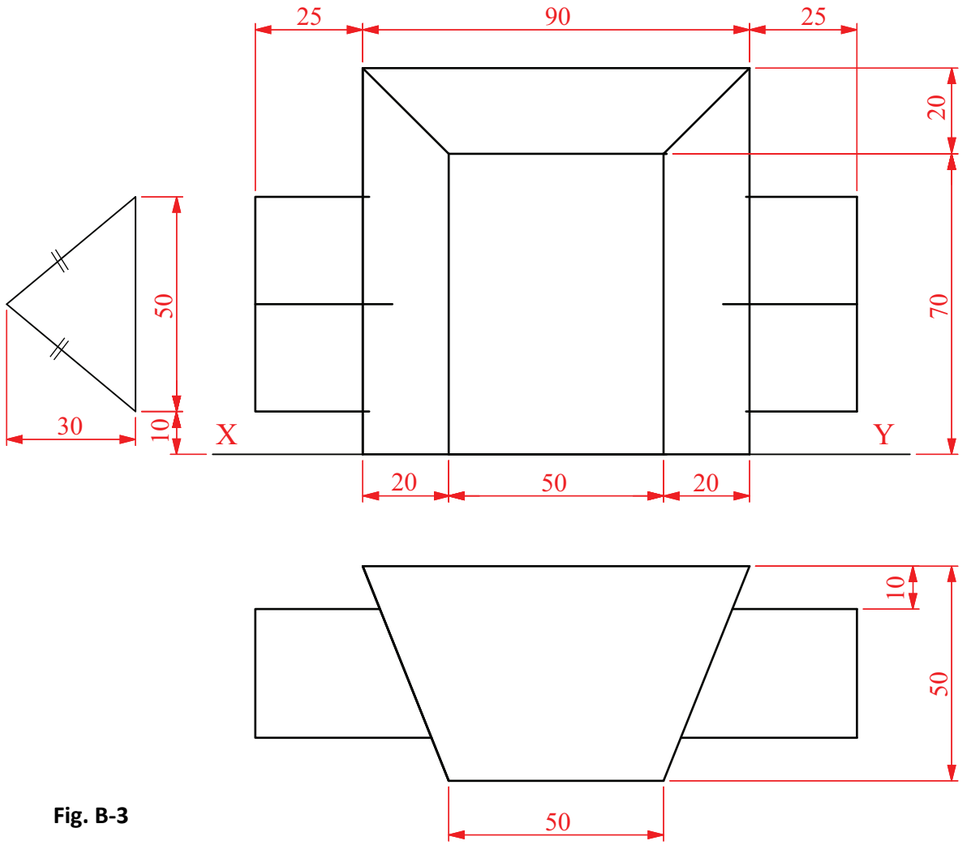


Fig. B-3

Assemblies

C-5. The graphic on the right shows a series of spice jars.

Details of the parts which make a spice rack to hold the spice jars are given in Fig. C-5 below. A parts list is also shown.

Draw the ***sectional elevation*** **A-A** of the assembled spice rack.

(Any omitted dimensions may be estimated.)

Scale 1:1

Part	Name	Qty.
1	Handle	1
2	Base	1
3	Side panel	2
4	Rod	2
5	Foot	2

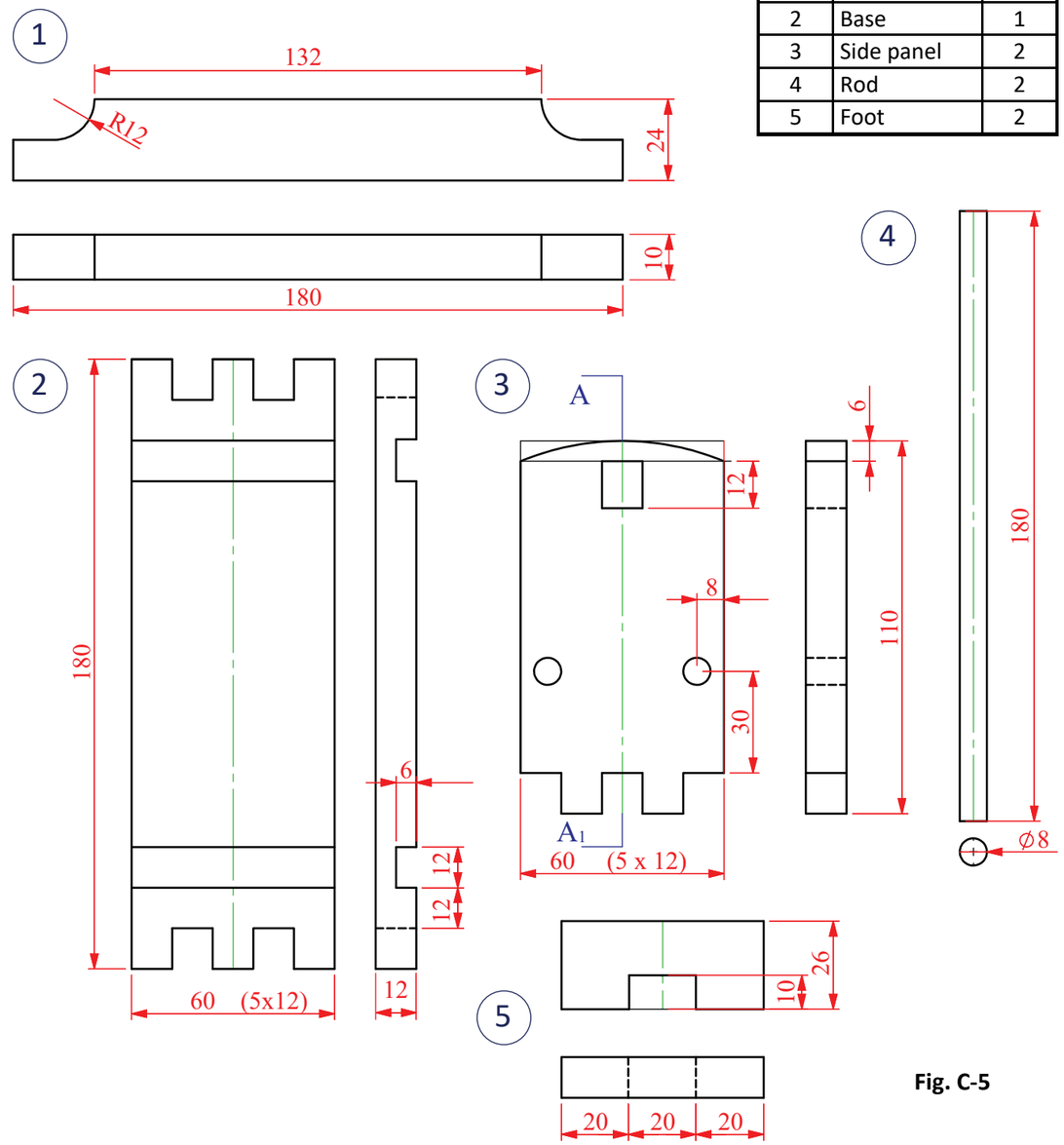


Fig. C-5

Dynamic Mechanisms

C-4. **(a)** The graphic on the right shows a series of cam mechanisms from the engine of a dune buggy.

A cam, similar to the one shown, imparts the following motion to an inline knife-edge follower:

- 0° to 150° Rise 45mm with uniform velocity
- 150° to 240° Dwell
- 240° to 360° Fall 45mm with simple harmonic motion.

Draw the displacement diagram for the cam.

*(**Note:** It is not necessary to draw the cam profile.)*

(In the displacement diagram, use a distance of 15mm to represent each 30° interval.)

(b) The wheels of the dune buggy rotate clockwise as it rolls forward.

In Fig. C-4(b) below, circle **C** represents the wheel.
In the diagram, circle **C** rolls clockwise along line **AB** for one full revolution.

Plot the locus of point **P** for this movement.

Scale 1:1

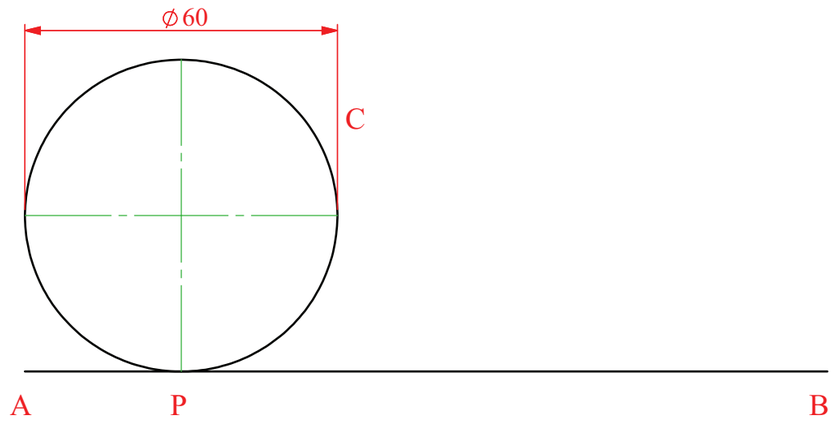


Fig. C-4(b)

SECTION C - Applied Graphics

Answer **any two** questions (i.e. the options you have studied) from this section on drawing paper.

Geologic Geometry

C-1. The accompanying map, located on the back page of Section A, shows ground contours at five metre vertical intervals.

(a) On the drawing supplied, draw a vertical section (profile) on the line **AB**.

(b) Find and indicate on the map the maximum height difference along the profile **AB**.

(c) **CD** is the centreline of a proposed roadway which is level at an altitude of 85m.
Using side slopes of 1:1 for the embankments, complete the earthworks on the northern side, which are necessary to accommodate the roadway.

*(**Note**: The earthworks on the southern side of the roadway have already been completed.)*

Scale 1:1000

Structural Forms

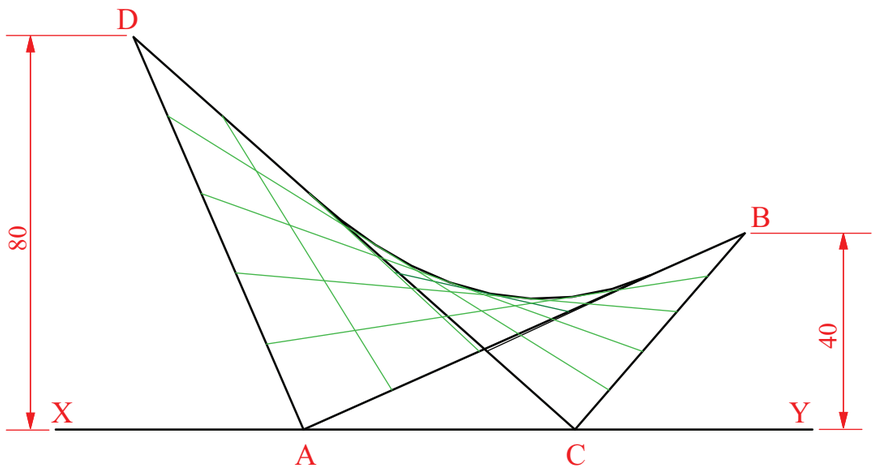
C-2. The graphic on the right shows a modern church. Its roof is in the form of a hyperbolic paraboloid.

The plan and elevation of a typical hyperbolic paraboloid surface are shown in Fig. C-2.

(a) Draw the given plan and elevation of the hyperbolic paraboloid surface.

(b) Project an end view of the hyperbolic paraboloid surface.

Scale 1:1



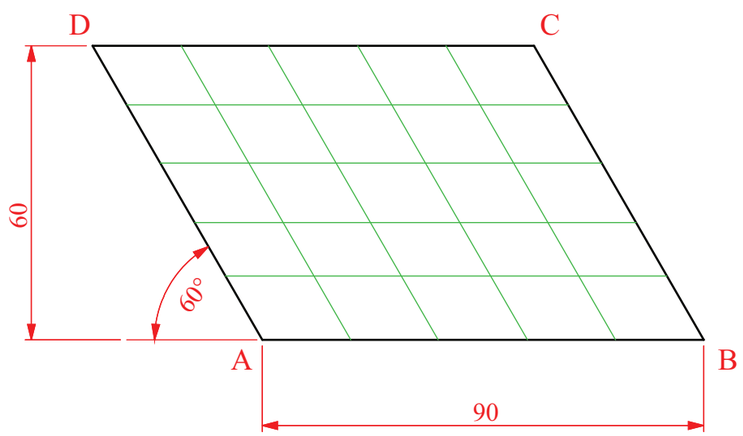


Fig. C-2

Surface Geometry

C-3. The graphic on the right shows a handbag.

Fig. C-3 below shows the plan and elevation of a design for a handbag.

(a) Draw the plan and elevation of the handbag as shown in Fig. C-3.

(b) Project an end view of the handbag.

(c) Draw a one-piece surface development of the handbag.

*(**Note:** Ignore the handle of the bag for the purpose of your drawing.)*

Scale 1:1

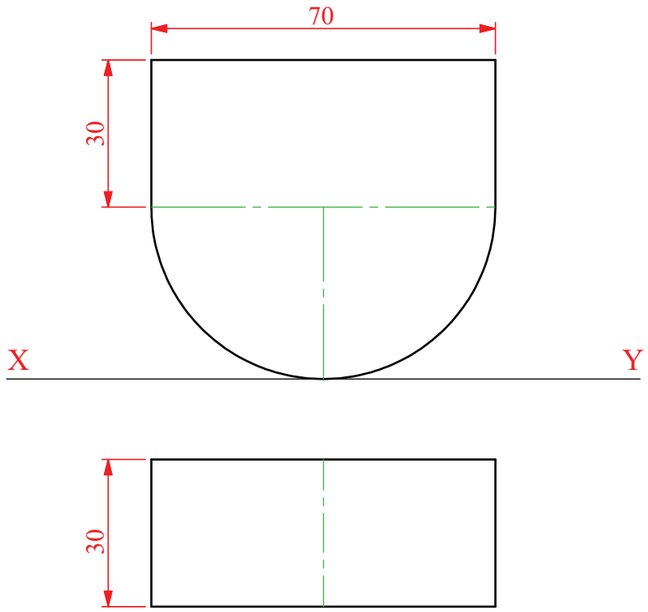


Fig. C-3