



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2012

Design & Communication Graphics
Ordinary Level

Section A (60 marks)

Wednesday, 20 June
Afternoon, 2.00 - 5.00

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:

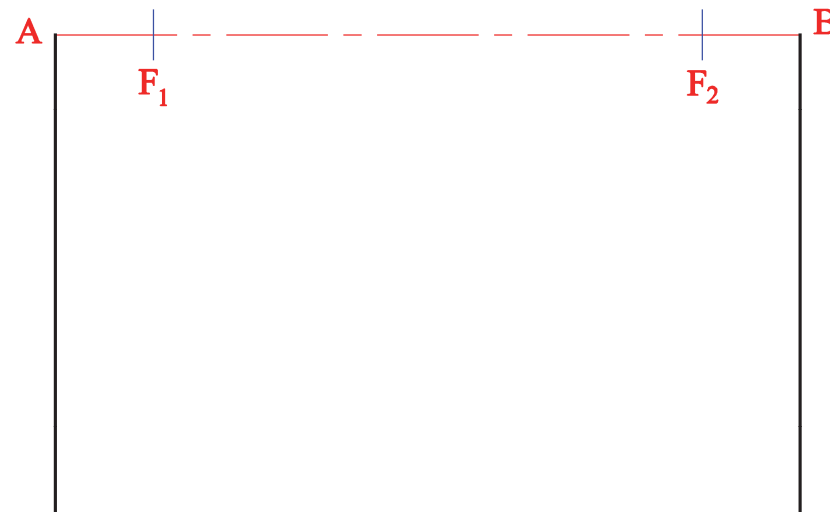
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box below and on all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

Examination Number:

SECTION A - Core - Answer Any Three of the questions on this A3 sheet

A-1. The 3D graphic below shows a garage door. The top of the door is in the shape of a semi-ellipse.
In the drawing of the door on the right, **AB** is the major axis of the ellipse. The focal points are also shown.

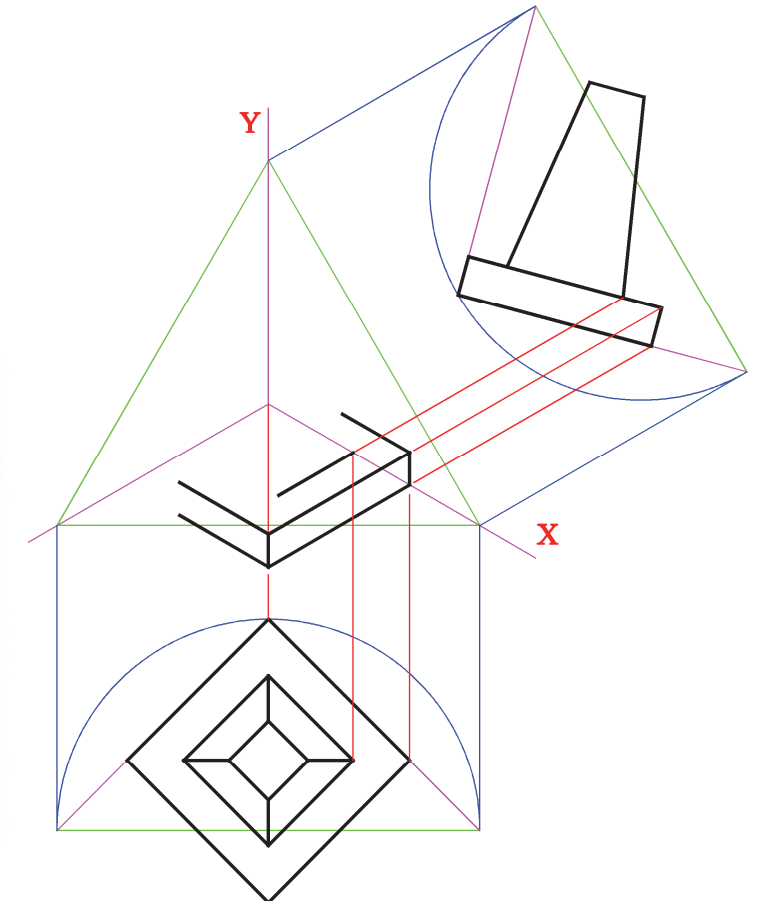
- (a) Locate the minor axis of the ellipse.
- (b) Draw the semi-ellipse.



A-3. The 3D graphic below shows a traffic bollard.

A set of isometric axes and a partially completed outline drawing of the bollard are shown on the right. The elevation and plan of the bollard have been positioned relative to the axes as shown.

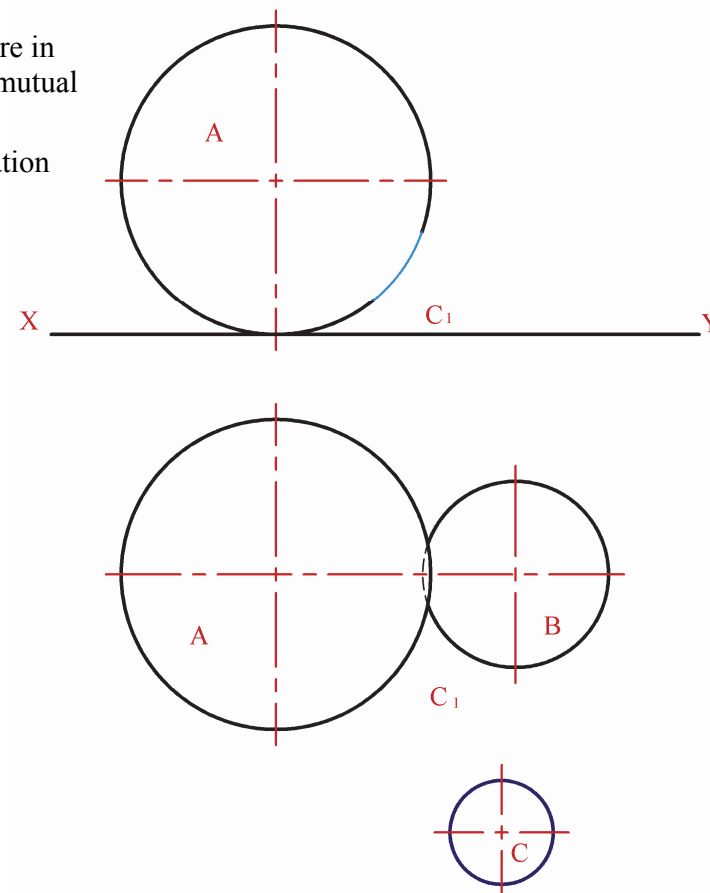
Complete the axonometric projection.



A-2. The 3D graphic below shows a garden water feature in which three spheres rest on the ground and are in mutual contact.

The drawing on the right shows the plan and elevation of sphere **A**. The plan of sphere **B** is also shown.

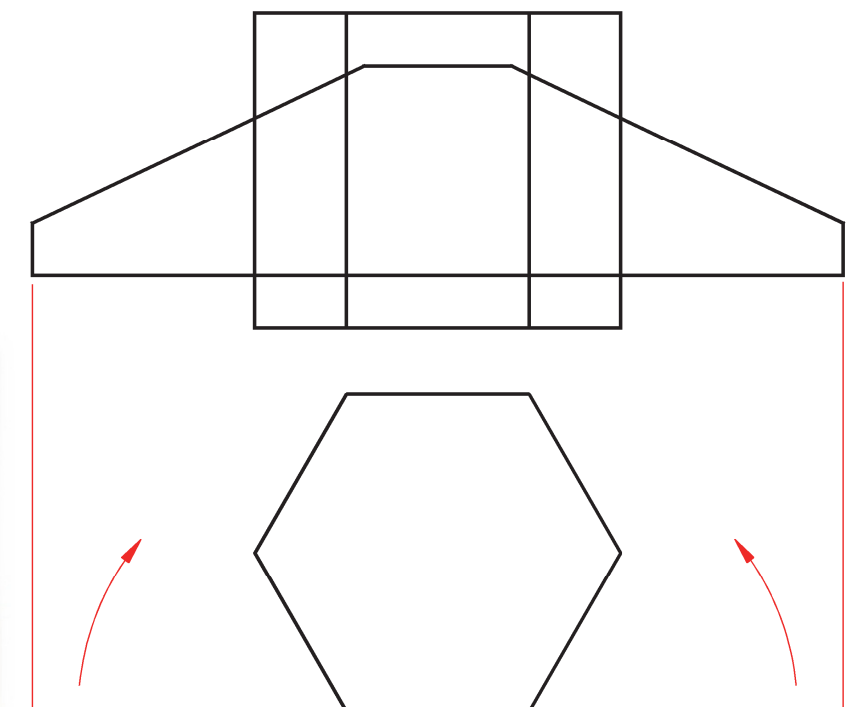
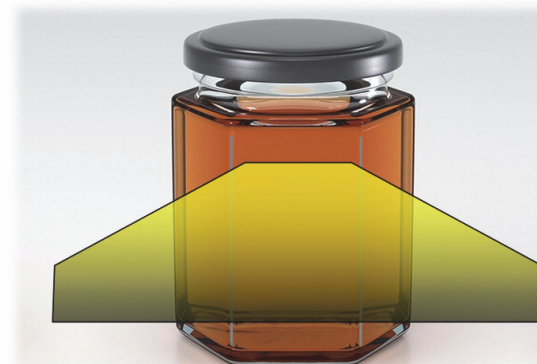
- (a) Draw the elevation of sphere **B**.
- (b) Draw the plan and elevation of the third Sphere, **C** (shown in blue) when it has been moved into position **C₁** and is in contact with the given spheres **A** and **B**.



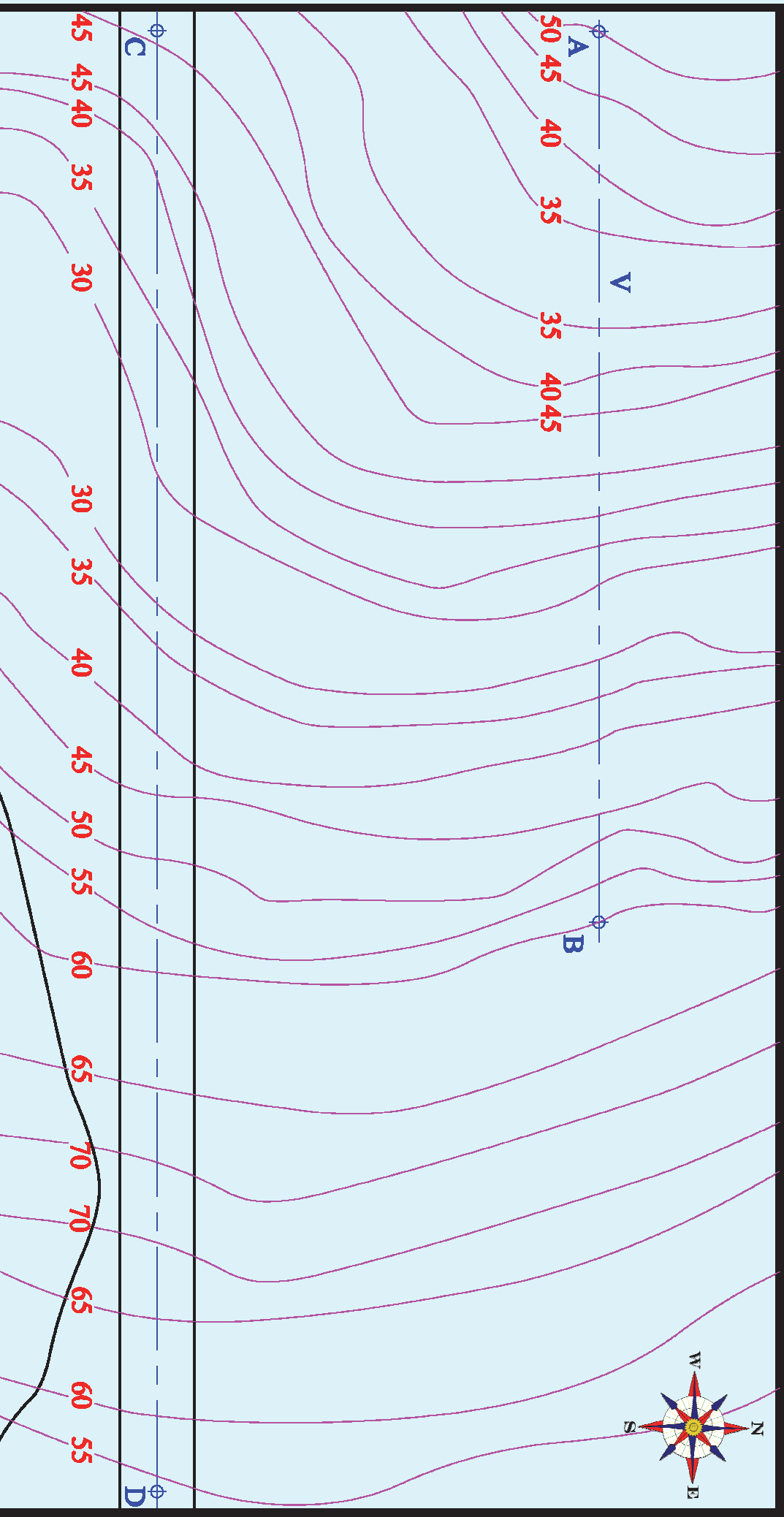
A-4. The 3D graphic below shows a jar of honey and a label which is to be wrapped around it.

The drawing on the right shows the plan and elevation of the label and the hexagonal portion of the glass jar.

Complete the elevation showing the label in the wrapped position.



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





Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2012

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

Wednesday, 20 June
Afternoon, 2.00 - 5.00

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.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box provided on section A and on all other sheets used.*

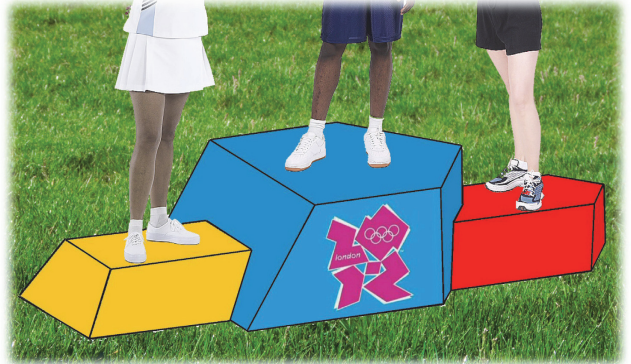
SECTION B - Core

Answer **Any Two** questions from this section on drawing paper

B-1. The 3D graphic on the right shows a design for a podium for this year's Olympic Games.

Fig. B-1 below shows the plan and elevation of the podium.

- Draw the given plan and elevation of the podium and show all lines of interpenetration.
- Draw an end view of the podium.



Scale 1:1

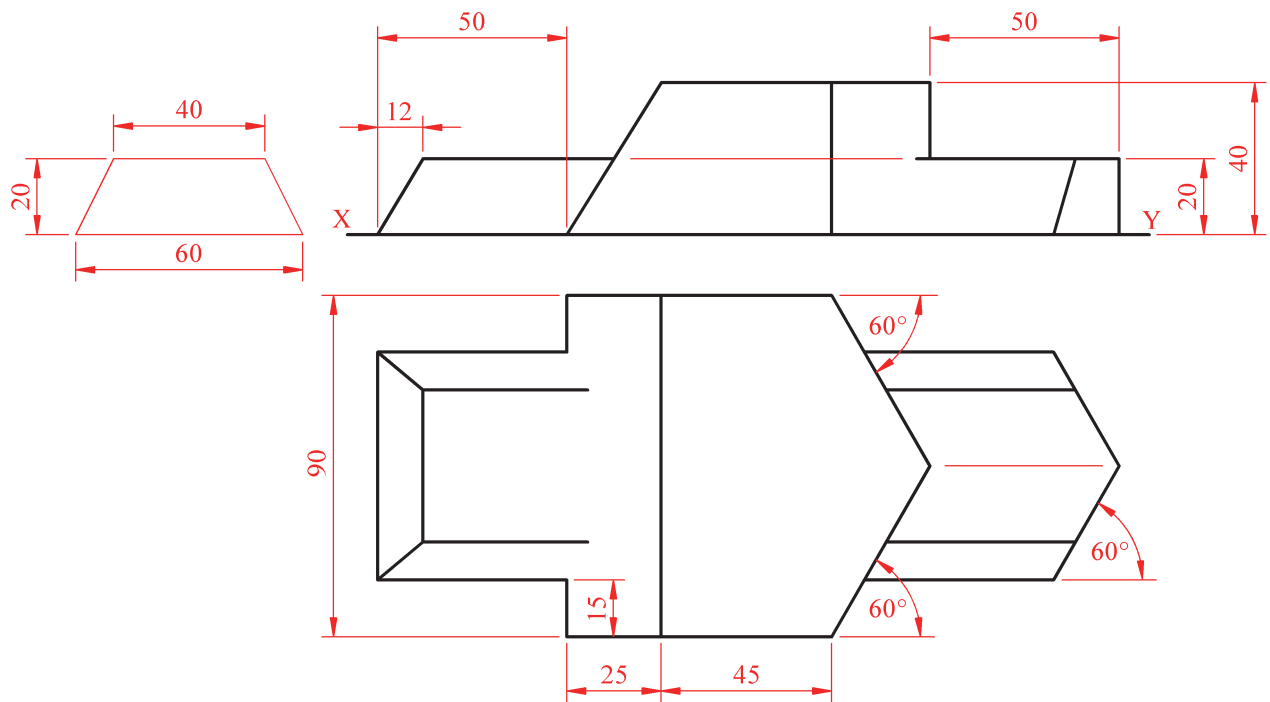


Fig. B-1

B-2. The 3D graphic on the right shows a table tennis table.

Fig. B-2 below shows the plan and elevation of a model of the table and net.

(a) Draw the given plan.

(b) Make a perspective drawing of the structure given the following:

- The spectator point is 70mm from corner A
- The picture plane is touching corner A
- The horizon line is 80mm above the ground line.

Scale 1:1

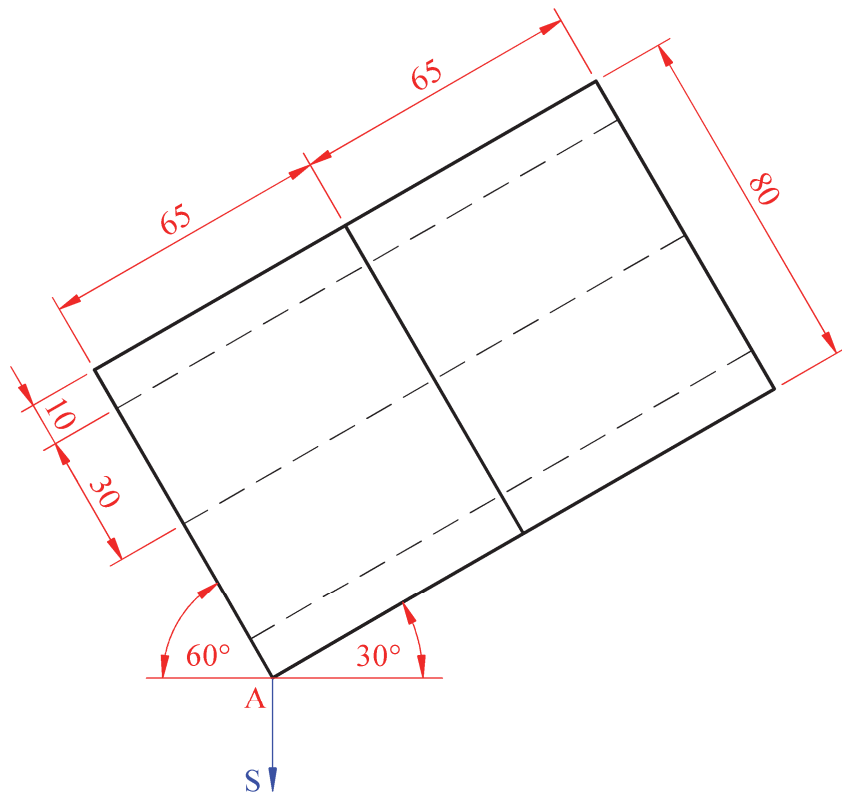
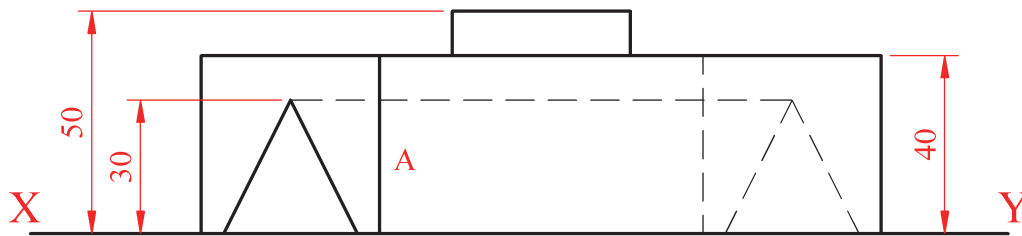


Fig. B-2

B-3. The 3D graphic on the right shows an MP3 player docking station.

Fig. B-3 below shows an isometric view of the device.

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

(Note: Only the docking station needs to be drawn. The MP3 player, shown in the 3D graphic should be ignored.)

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

Scale 1:1

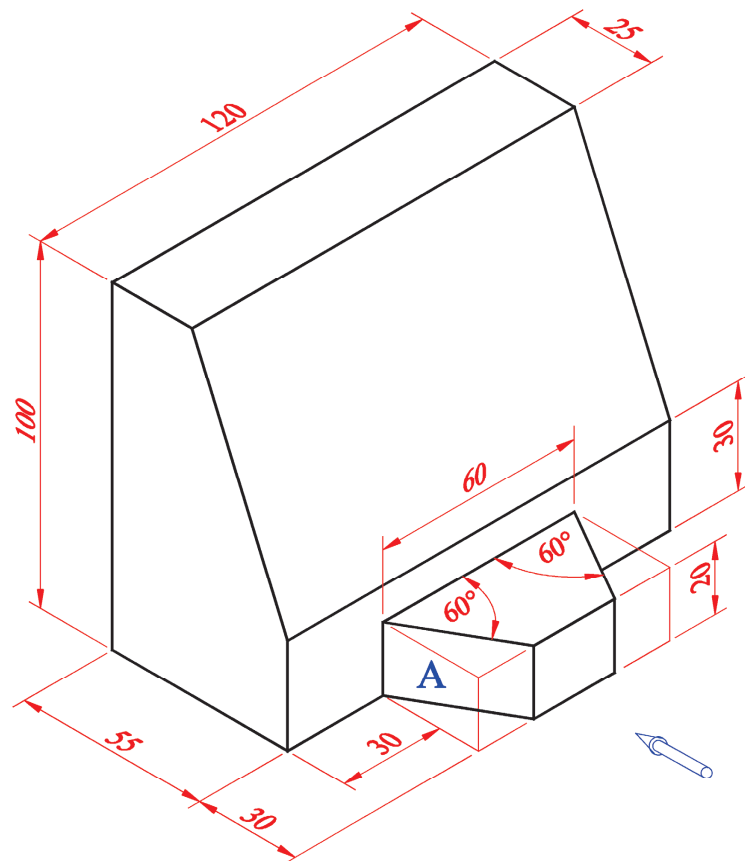


Fig. B-3

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) It is proposed to use the valley at V as a reservoir for the generation of hydro-electricity. Draw a line on the profile to indicate the maximum depth of water this valley will hold.
- (c) **CD** is the centreline of a proposed roadway which is level at an altitude of 75m.

Using side slopes of 1 in 1 for the embankments, complete the earthworks on the northern side, that 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 3-D graphic on the right shows an Irish hotel with a modern roof structure.

Hyperbolic paraboloid surfaces are often used in structures such as this.

Fig. C-2 below shows the plan and elevation of a typical hyperbolic paraboloid surface **ABCD**.

- (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

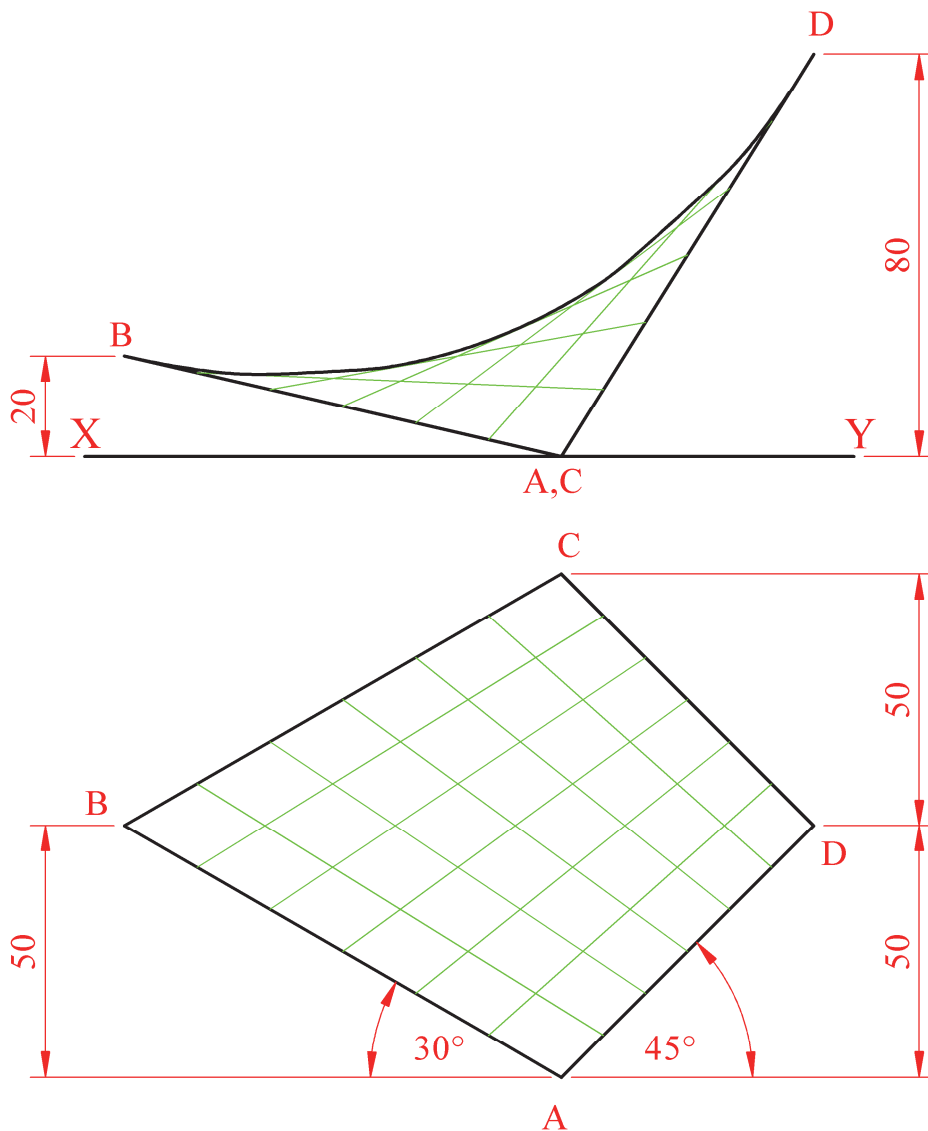


Fig. C-2

Surface Geometry

C-3. The 3D graphic on the right shows a design for a sweet box.

The plan and elevation of the box are shown in Fig. C-3 below.

- (a) Draw the given views.
- (b) Draw a one-piece surface development of the box.

(The 3D graphic shows text and a clear window opening, which should be ignored for the purpose of your drawing.)

Scale 1:1

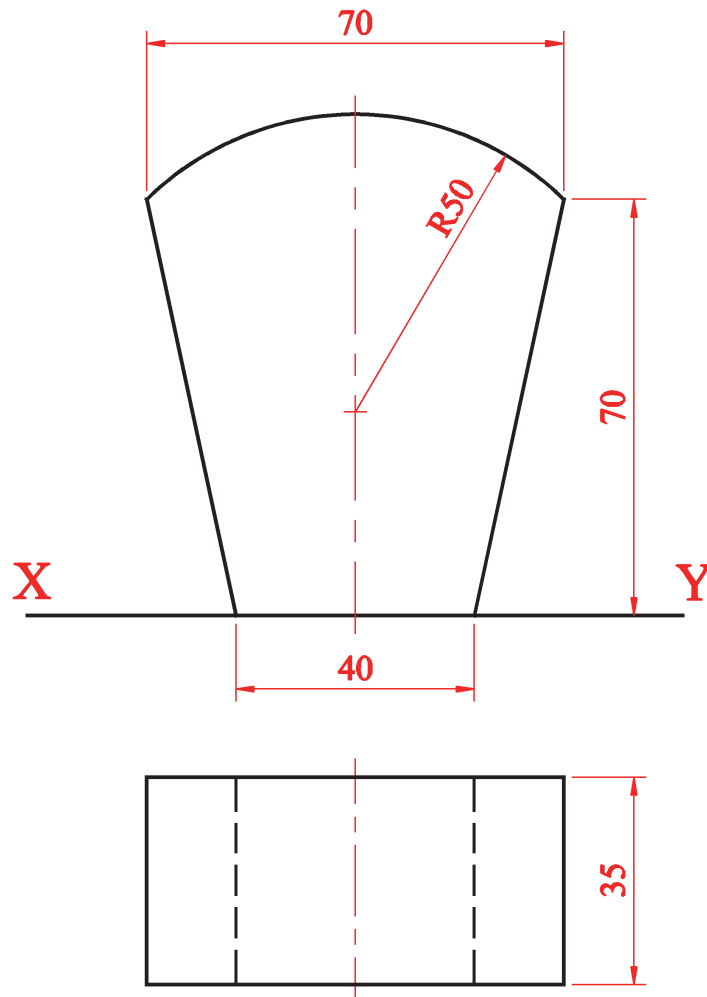


Fig. C-3

Dynamic Mechanisms

C-4. (a) The graphic on the right shows a cam which forms part of a quick release mechanism for a bicycle wheel.

A similar cam imparts this motion to a follower:

- 0° to 90° Rise 60mm with uniform velocity
- 90° to 180° Dwell
- 180° to 360° Fall 60mm with simple harmonic motion.

Draw the displacement diagram.

Note: It is not necessary to draw the profile of the cam.

Scale 1:1



(b) The graphic on the left below shows a waterslide which is in the form of a helix.

Fig C-4 on the right shows the plan and elevation of a partially completed helix.

The helix moves from point **A** at the bottom of the cylinder, to point **B** at the top of the cylinder, in one revolution.

Draw the given plan and elevation of the cylinder and complete the remainder of the helix.

Scale 1:1

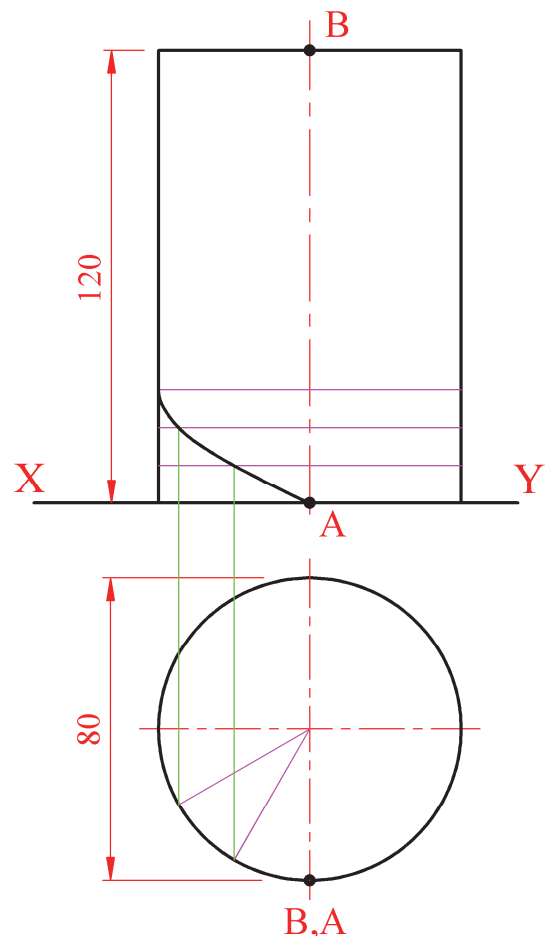


Fig. C-4

Assemblies

C-5. Details of a Soap Holder are given in Fig. C-5 with the parts list tabulated below. A 3D graphic of the individual parts is also shown.

Note: Some of the parts have been shown when sectioned by plane A-A.

Draw the **sectional elevation A-A** of the assembled Soap Holder.

(Any omitted dimensions may be estimated.)

Scale 1:1

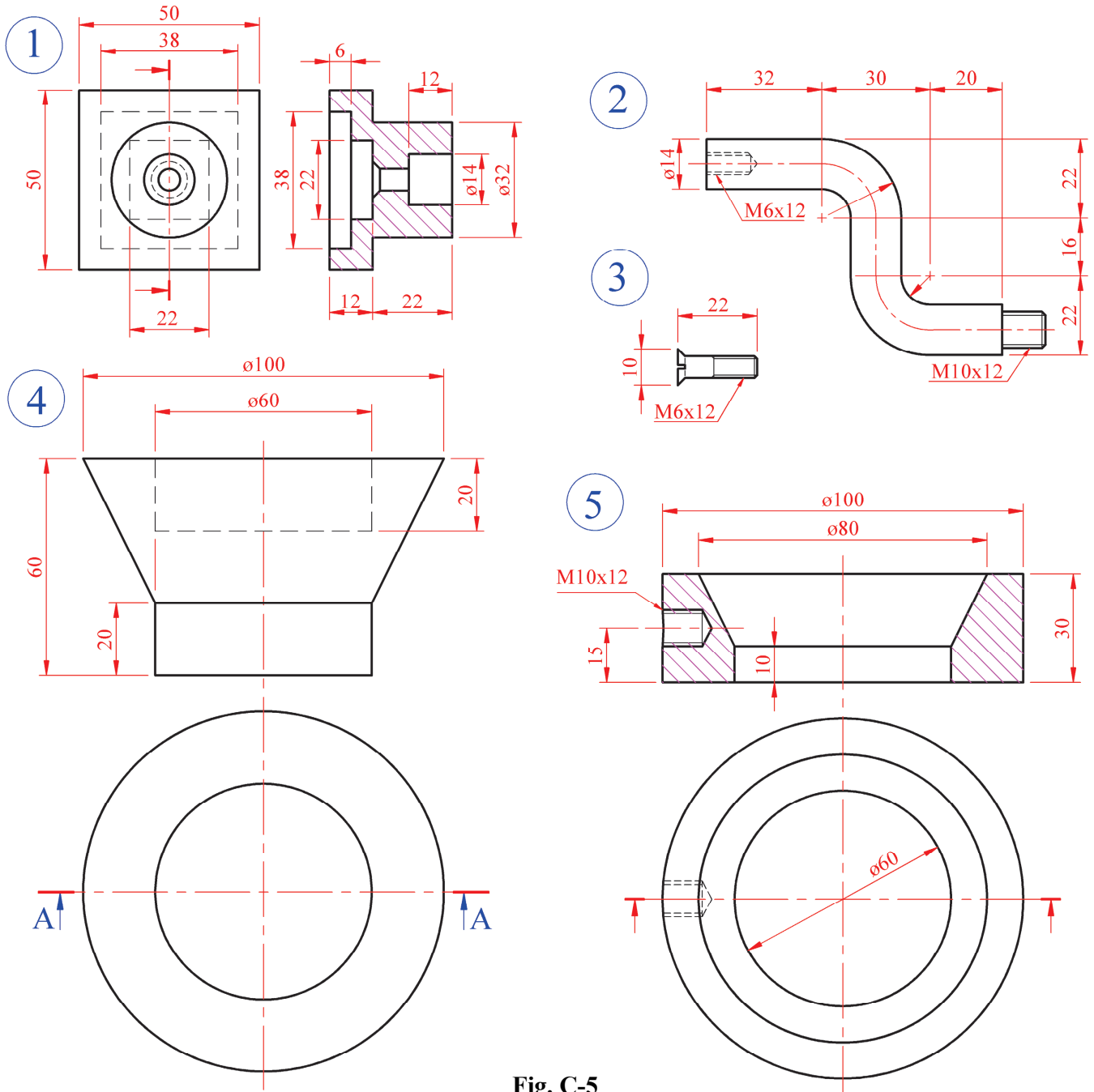


Fig. C-5

Part	Name	Qty.
1	Wall Mount	1
2	Stem	1
3	Countersunk Screw	1
4	Soap Dish	1
5	Dish Support	1



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