



Leaving Certificate Examination, 2017

Design & Communication Graphics
Ordinary Level

Section A (60 marks)

Wednesday, 21 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.*

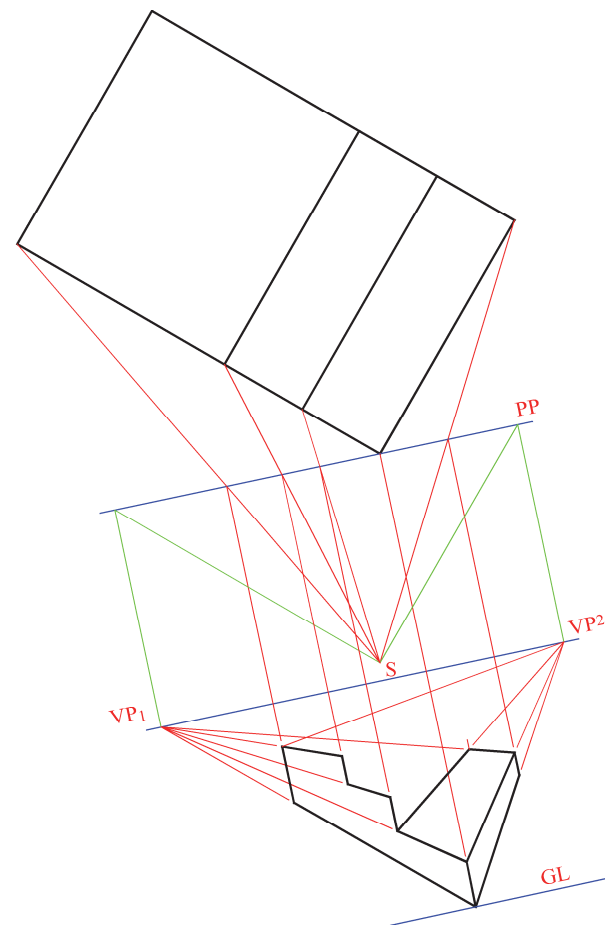
Examination Number:

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

A-1. The image below shows three steps at the entrance to a home.

The drawing on the right shows the plan and a partially completed perspective view of similar steps.

Complete the perspective drawing of the steps.



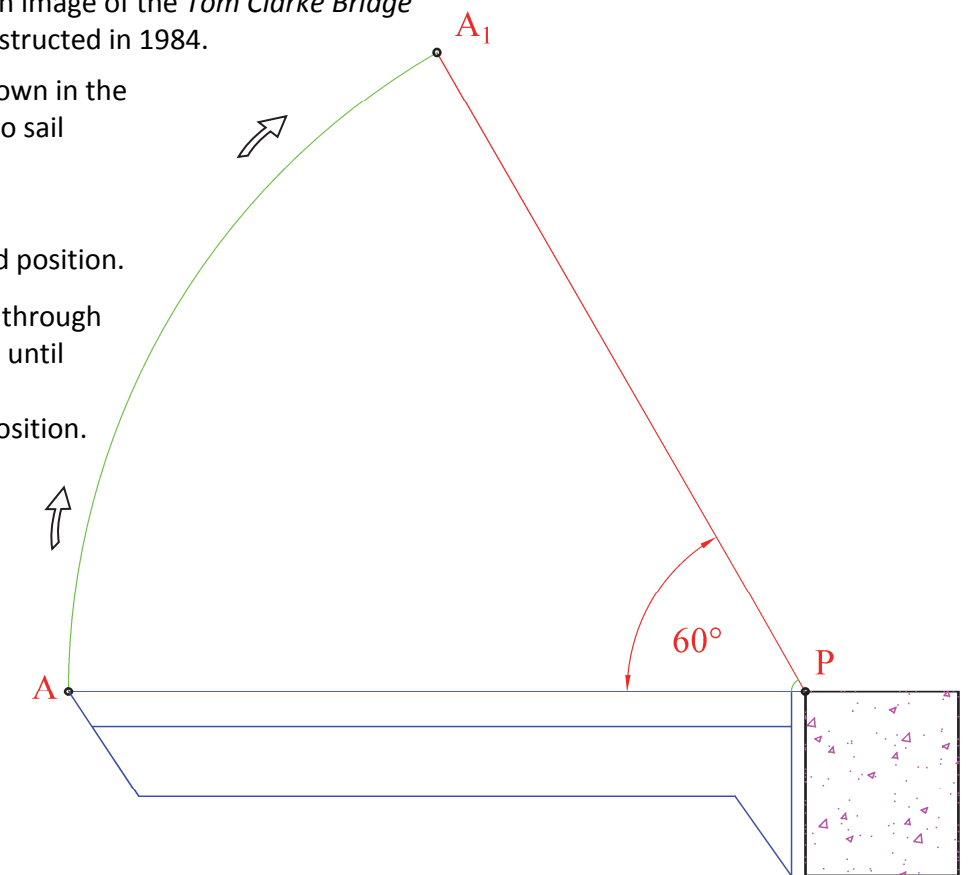
A-3. The 3D graphic below shows an image of the *Tom Clarke Bridge* in Dublin. This bridge was constructed in 1984.

The bridge can be raised as shown in the graphic to enable large boats to sail further up the river Liffey.

The elevation of the bridge is shown on the right in its closed position.

The bridge is rotated upwards through an angle of 60° , about point P , until point A reaches A_1 .

Draw the bridge in the open position.

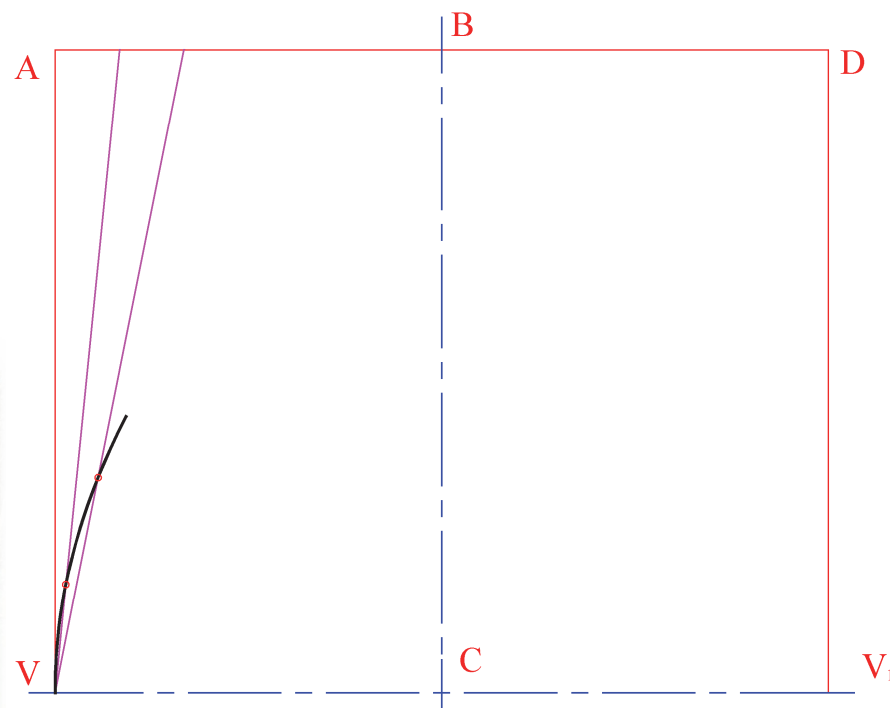


A-2. *Glamping* or glamorous camping appeals to those seeking adventure while on holiday. The graphic below shows an image of a glamping hut which is based on two semi-parabolas.

In the given drawing a portion of one parabola is inscribed in the rectangle $VABC$. Its vertex is located at V .

(a) Locate the remaining points on the semi-parabola in the rectangle $VABC$ and complete this curve.

(b) The second semi-parabola, in rectangle V_1DBC , is a mirror image of the first parabola, with BC as the axis of symmetry. Draw the second parabola.

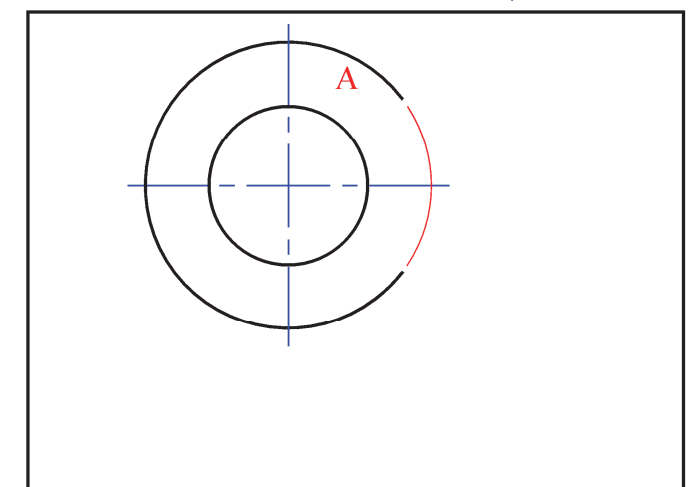
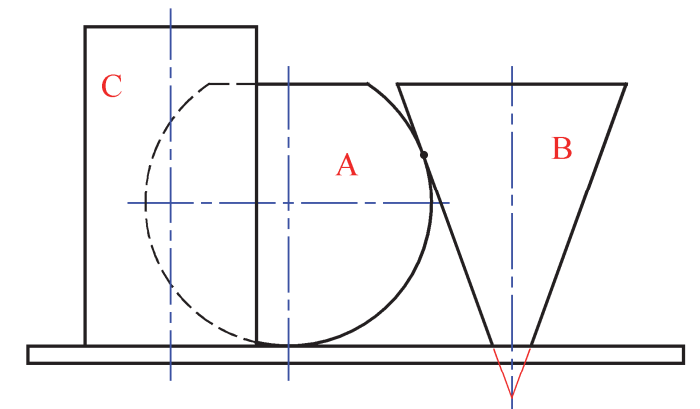
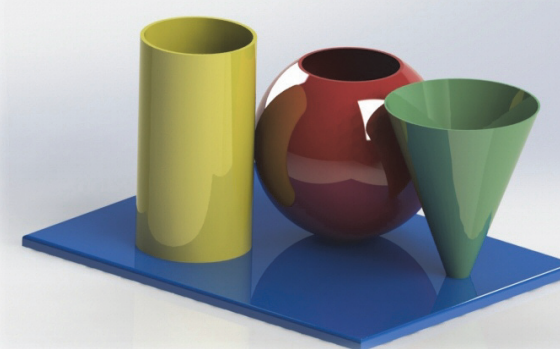


A-4. A *Desk Tidy*, in the form of geometrical objects which are in mutual contact, is shown in the 3D graphic below. The solids rest on a rectangular base.

The drawing on the right shows the elevation and partially completed plan of the desk tidy. It consists of a cylinder, a sphere, and a cone. The sphere and cone have been truncated as shown.

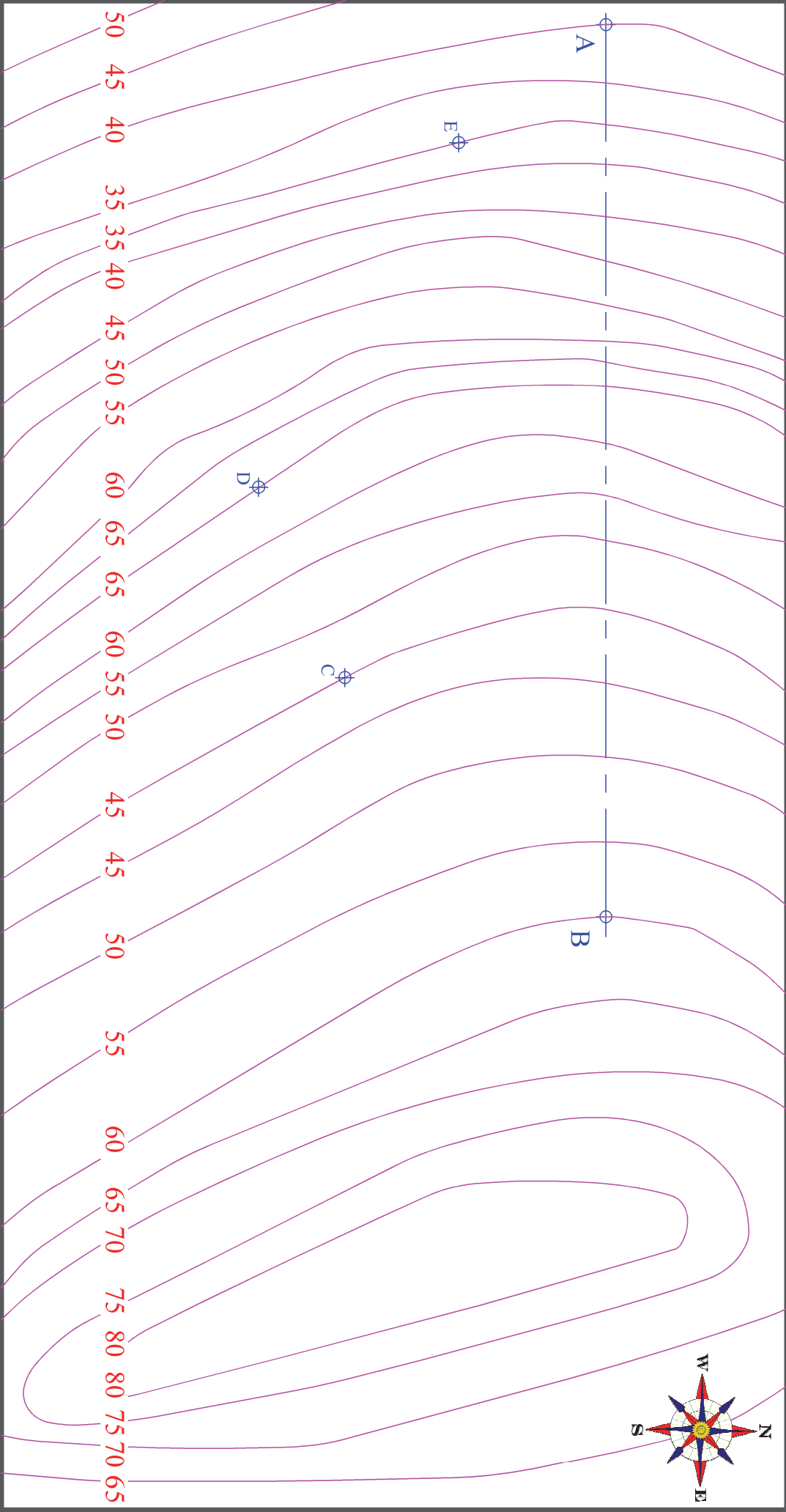
(a) Draw the plan of the truncated cone B .

(b) Draw the plan of cylinder C .



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)





Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2017

Design & Communication Graphics

Ordinary Level

Sections B and C (180 marks)

Wednesday, 21 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.

SECTION B - Core

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

B-1 The image on the right shows the main stage used in the *Glastonbury Music Festival*. It consists of a square-based pyramid with a canopy to provide shelter for the performers.

Fig. B-1 shows the elevation and incomplete plan of the structure.

- (a)** Draw the given plan and elevation of the structure.
- (b)** Complete the overhanging portion of the canopy on the left hand side in the plan
- (c)** Show all lines of interpenetration.
- (d)** Draw an end view of the structure.



Scale 1:1

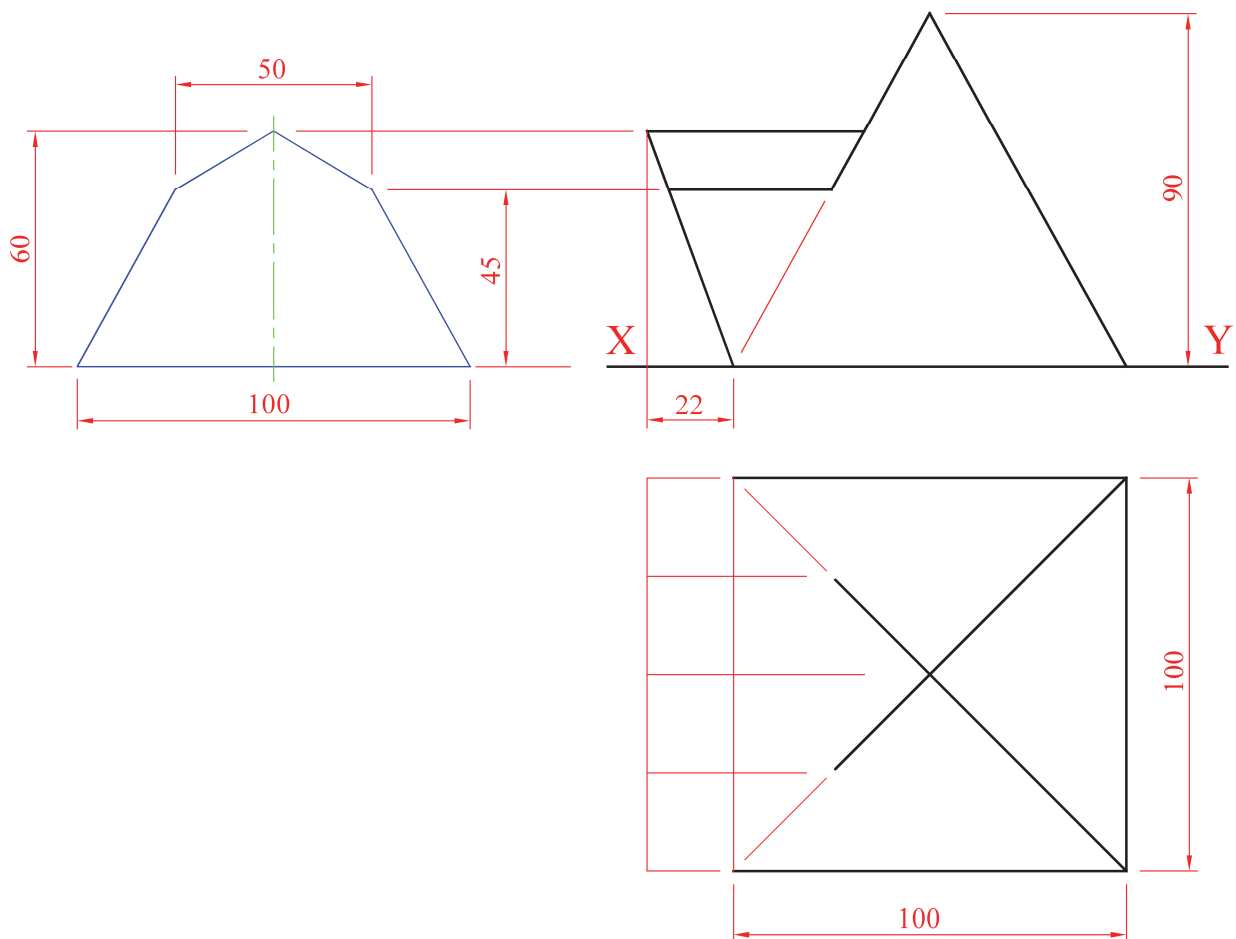


Fig. B-1

B-2 The 3D graphic on the right shows a digital camera.

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

The elevation and plan of the camera are also shown in their 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 body of the camera.
- (d) Draw the axonometric projection of the circular lens.

Scale 1:1

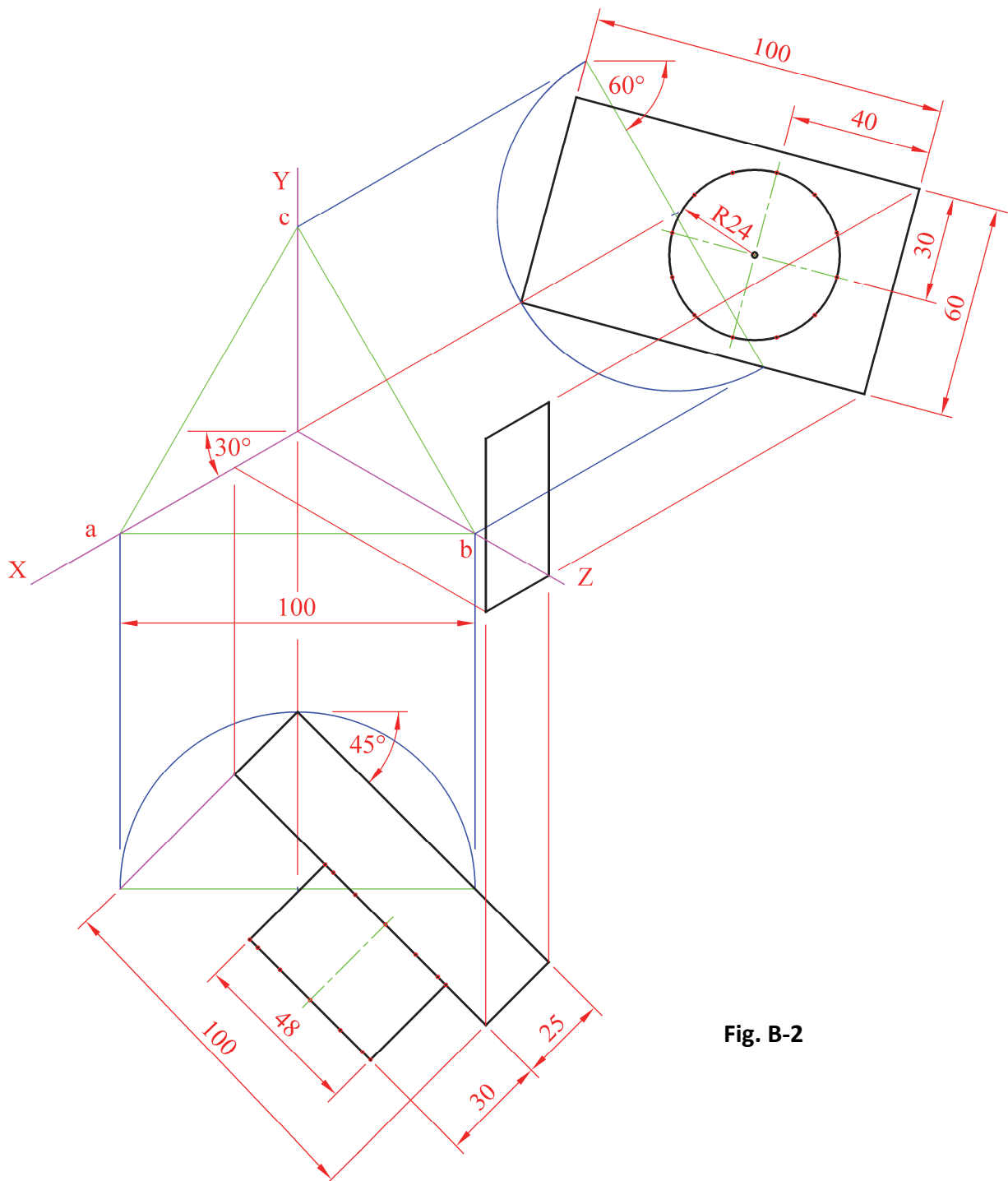


Fig. B-2

B-3. The 3D graphic on the right shows a fuel pump which rests on a concrete plinth in a garage forecourt.

Fig. B-3 below shows an isometric view of the pump and plinth.

- (a) Draw an elevation of the complete structure looking in the direction of the arrow.
- (b) Project a plan from the elevation.
- (c) Draw an auxiliary elevation of the **structure**, projected from the plan, which will include the true shape of surface **A**.

Scale 1:1

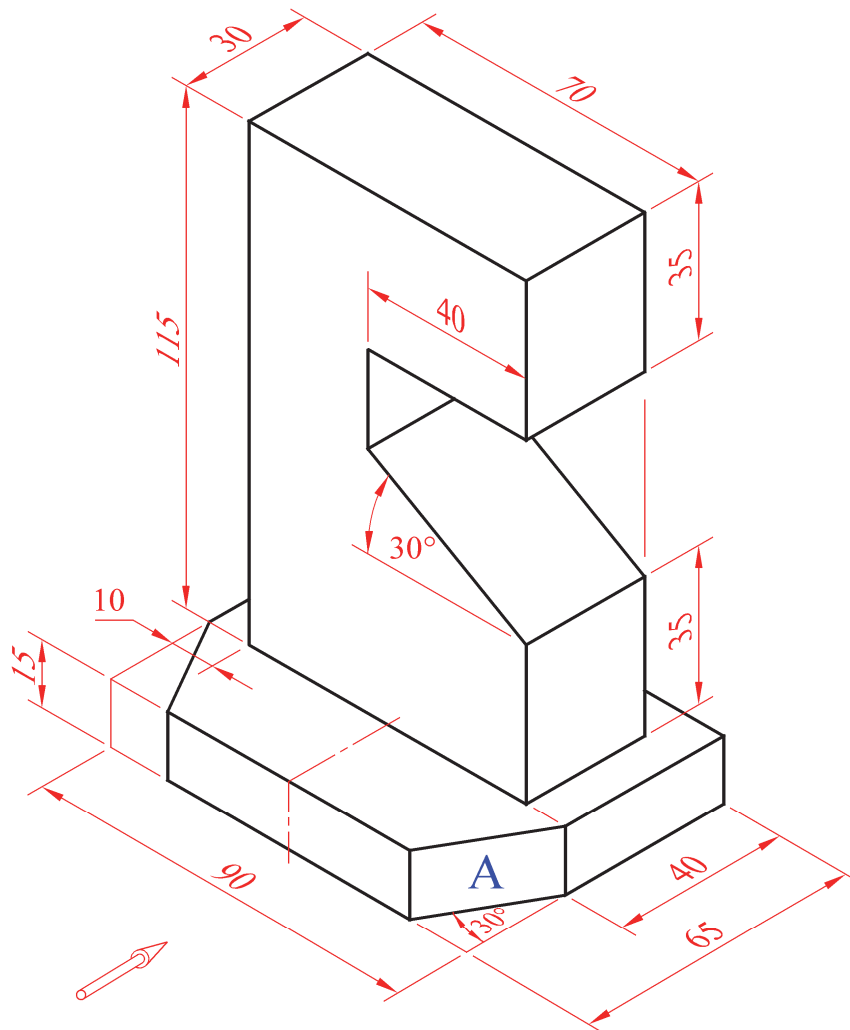


Fig. B-3

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)** Points **C**, **D** and **E** are outcrop points on the surface of a stratum of ore.
Draw the plan and elevation of the triangle **CDE**.
 - (c)** Determine the strike and dip of the stratum.

Scale 1:1000

Structural Forms

C-2 The graphic on the right shows a sculpture in Budapest. The sculpture is based on a hyperboloid of revolution and is formed by straight line elements connecting the circular top to the circular base as shown.

Fig. C-2 below shows the plan and elevation of a similar hyperboloid of revolution constructed using twelve equally spaced elements.

- (a) Draw the two given circles in plan and locate twelve equally spaced points on the circumference of the inner circle as shown. Draw the twelve elements tangential to the inner circle at these points.
- (b) Draw the elevation of the structure showing the elements projected from the plan.
- (c) Draw the freehand curves tangential to the elements in elevation as shown.



Scale 1:1

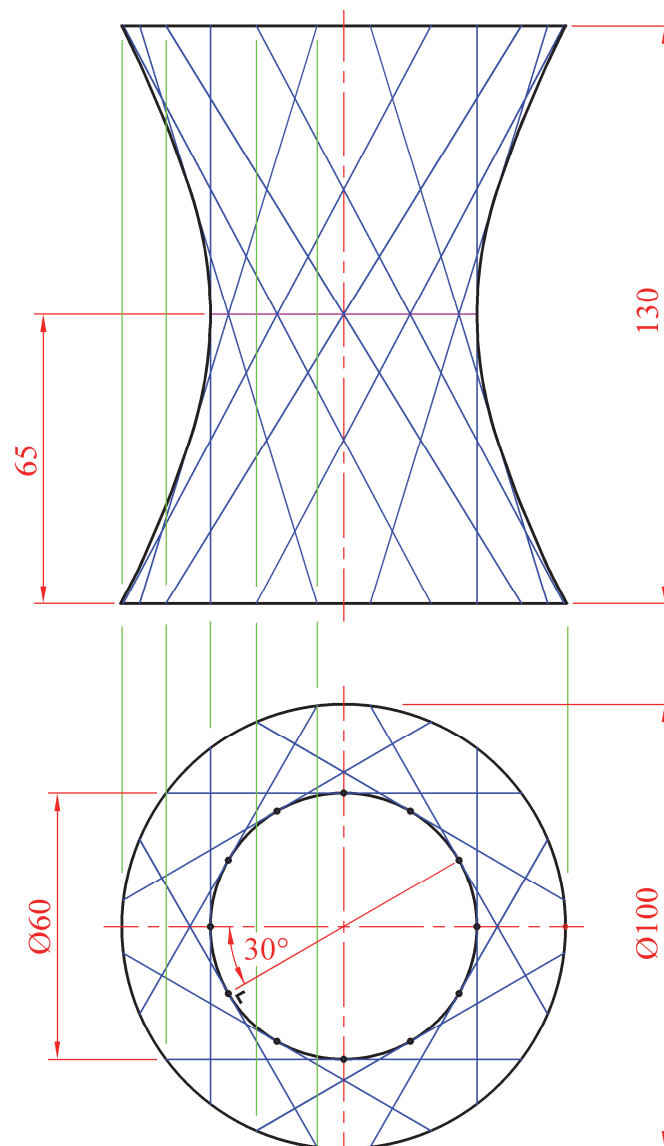


Fig. C-2

Surface Geometry

C-3 The 3D graphic on the right shows a perfume bottle and its storage box.

The projections of the storage box are shown in Fig. C-3 below.

- (a) Draw the given views of the box.
- (b) Project an end view of the box.
- (c) Draw a one-piece surface development of the box.

Scale 1:1

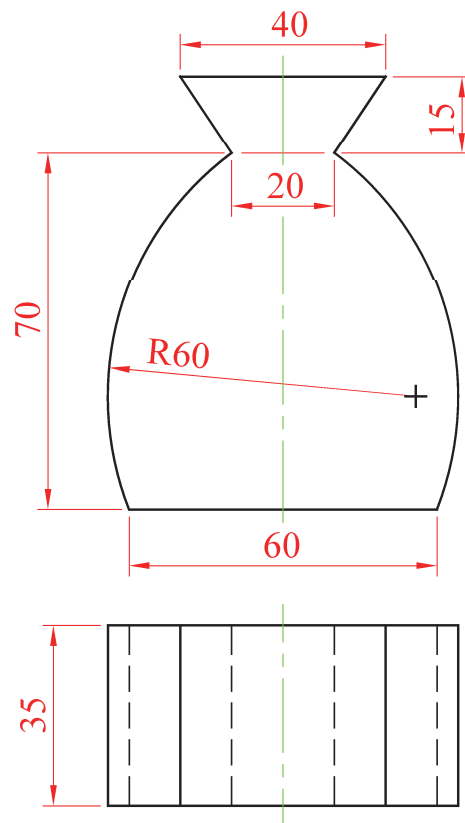


Fig. C-3

Dynamic Mechanisms

C-4 The graphic on the right shows an enlarged view of a cam mechanism from the engine of a trimmer.

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

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

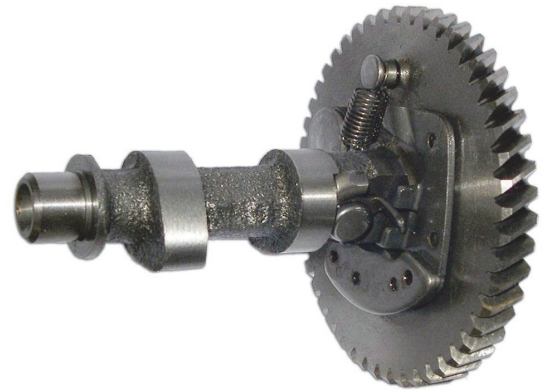
(a) Draw the displacement diagram for the cam.

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

(b) Draw the cam profile given the following information:

- The cam rotates in an anti-clockwise direction
- The nearest approach of the follower to the centre of the camshaft is 35mm
- The camshaft diameter is 16mm.

Scale 1:1



Assemblies

C-5 Details of a candlestick holder are given in Fig. C-5 below.

A parts list and a 3D graphic of the parts are also shown.

Draw the **sectional elevation** A-A of the assembled candlestick holder.

(Any omitted dimensions may be estimated.)

Scale 1:1

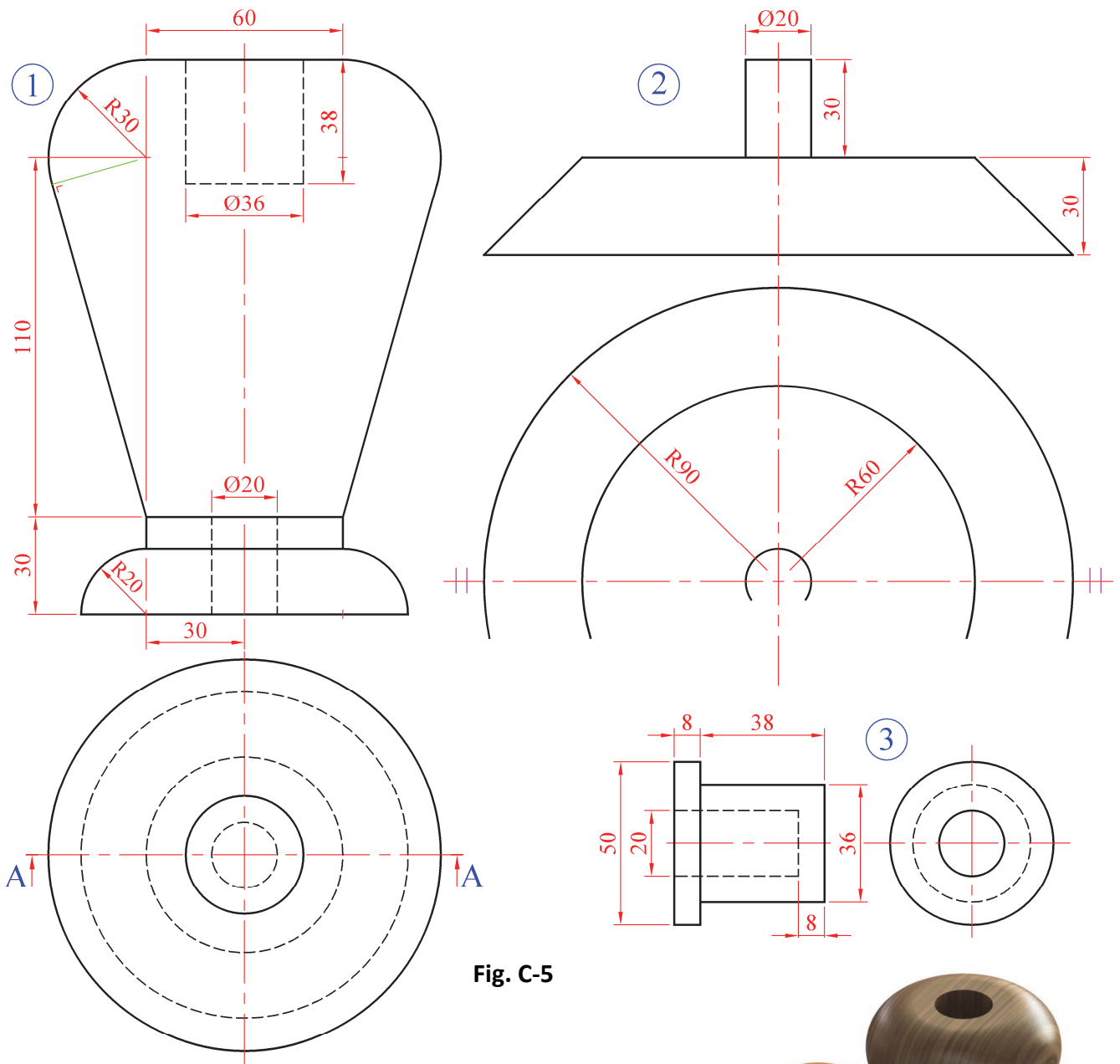
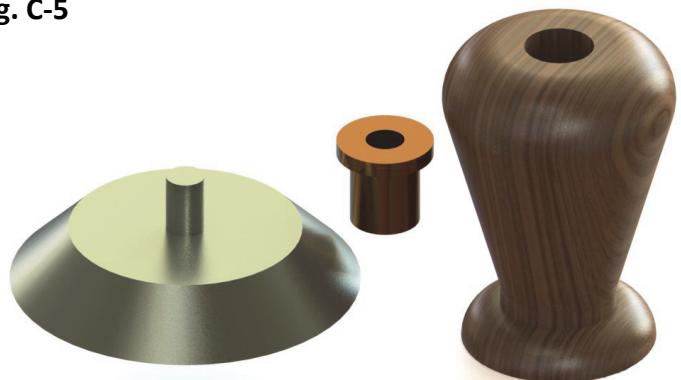


Fig. C-5

Part	Name	Qty.
1	Main Body	1
2	Base	1
3	Brass Insert	1



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