

Pre-Leaving Certificate Examination, 2018

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 Name and Teacher's Name in the box below and on all other sheets used.

Name:

School Name:

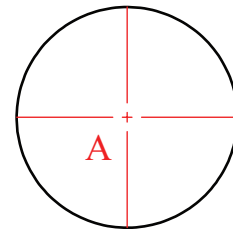
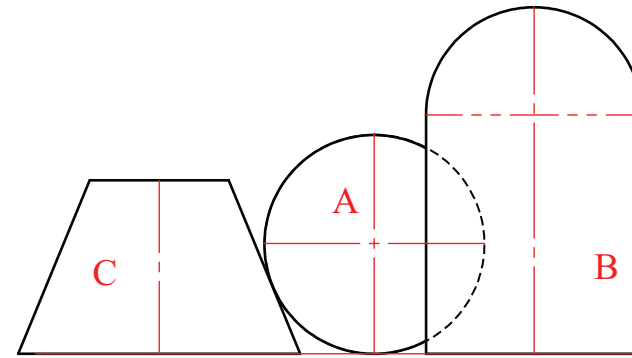
Teacher's Name:

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

A-1. The graphic of football equipment below, shows a sphere (A), a cylinder with hemispherical top (B) and a truncated cone (C). All solids rest on the floor and are in mutual contact.

The drawing on the right shows the elevation and partially completed plan of the football equipment.

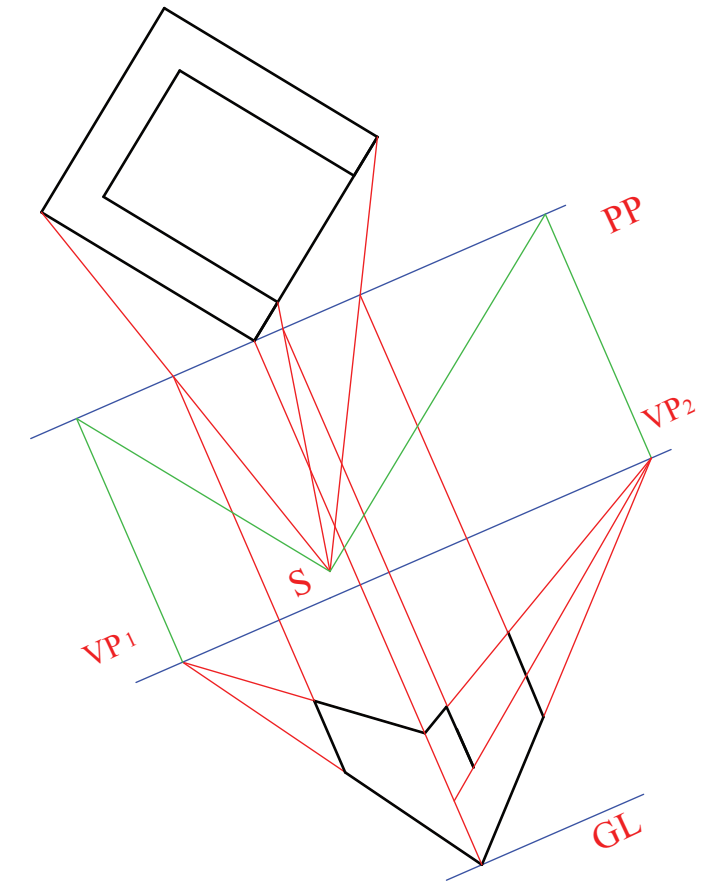
- (a) Draw the plan of cylinder B.
- (b) Draw the plan of the truncated cone C.



A-3. The graphic below shows a set of garden furniture.

The drawing on the right shows the plan and partially completed perspective view of one of the seats.

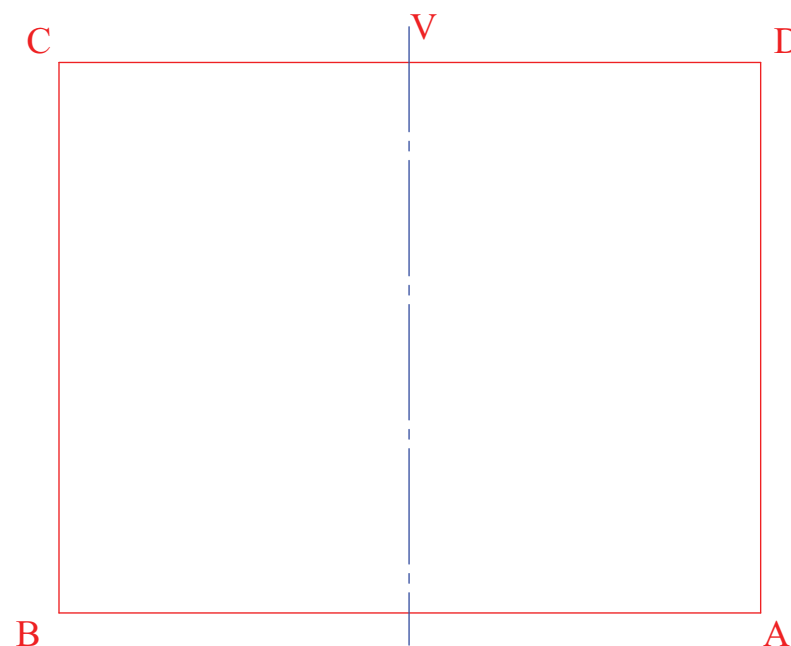
Complete the perspective drawing of the seat.



A-2. The graphic below shows a modern building, the elevation of which is in the shape of a parabola.

The drawing on the right shows a rectangle **ABCD** and the location of vertex **V** of the parabola.

Draw the outline of the parabola in the rectangle **ABCD**.

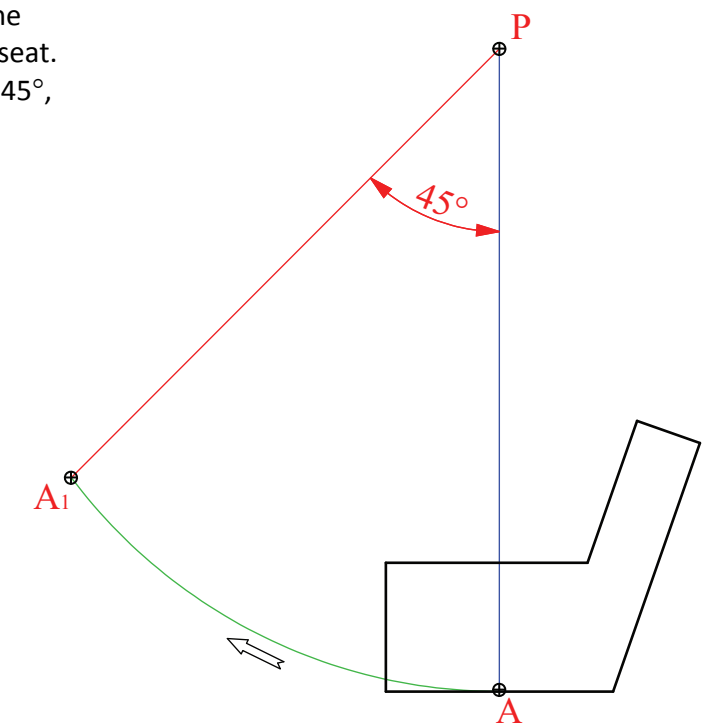


A-4. The graphic below shows a garden swing.

The seat swings forwards and backwards about a fixed point.

The drawing on the right shows the outline of the seat. Point **A** is the midpoint of the base of the seat. The seat is rotated forward through an angle of 45° , about point **P**, until point **A** reaches **A₁**.

Draw the outline of the seat in the rotated position.



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.

Pre-Leaving Certificate Examination, 2018

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

Time: 3 Hours

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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 Name, School Name and Teacher's Name in the box provided on section A and on all other sheets used.*

SECTION B - Core

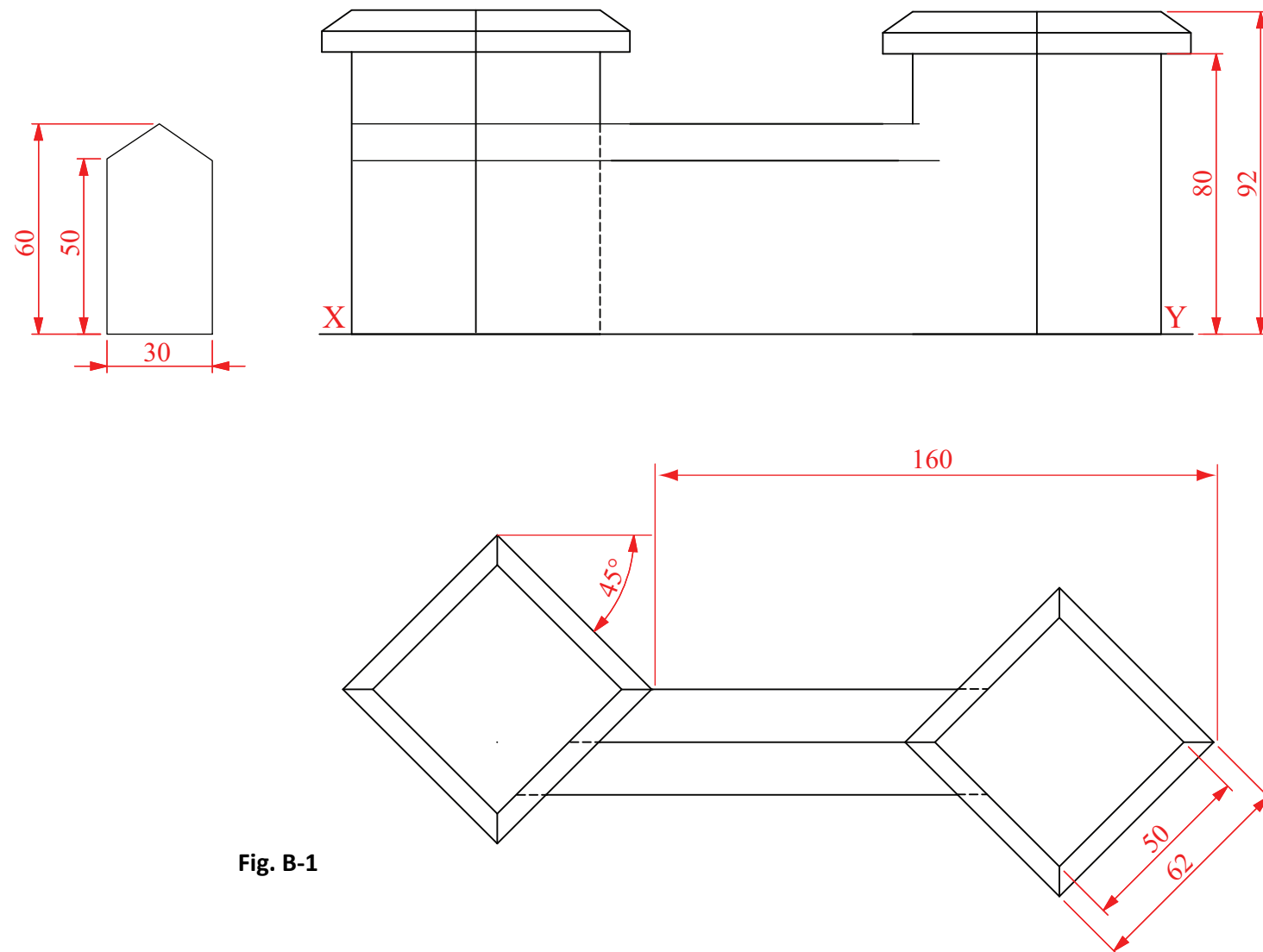
Answer **any two** questions from this section on drawing paper.

- B-1.** The 3D image on the right shows a brick garden wall.
The wall intersects the piers.

Fig. B-1 below shows the elevation and incomplete plan of a similar garden wall.



Scale 1:1



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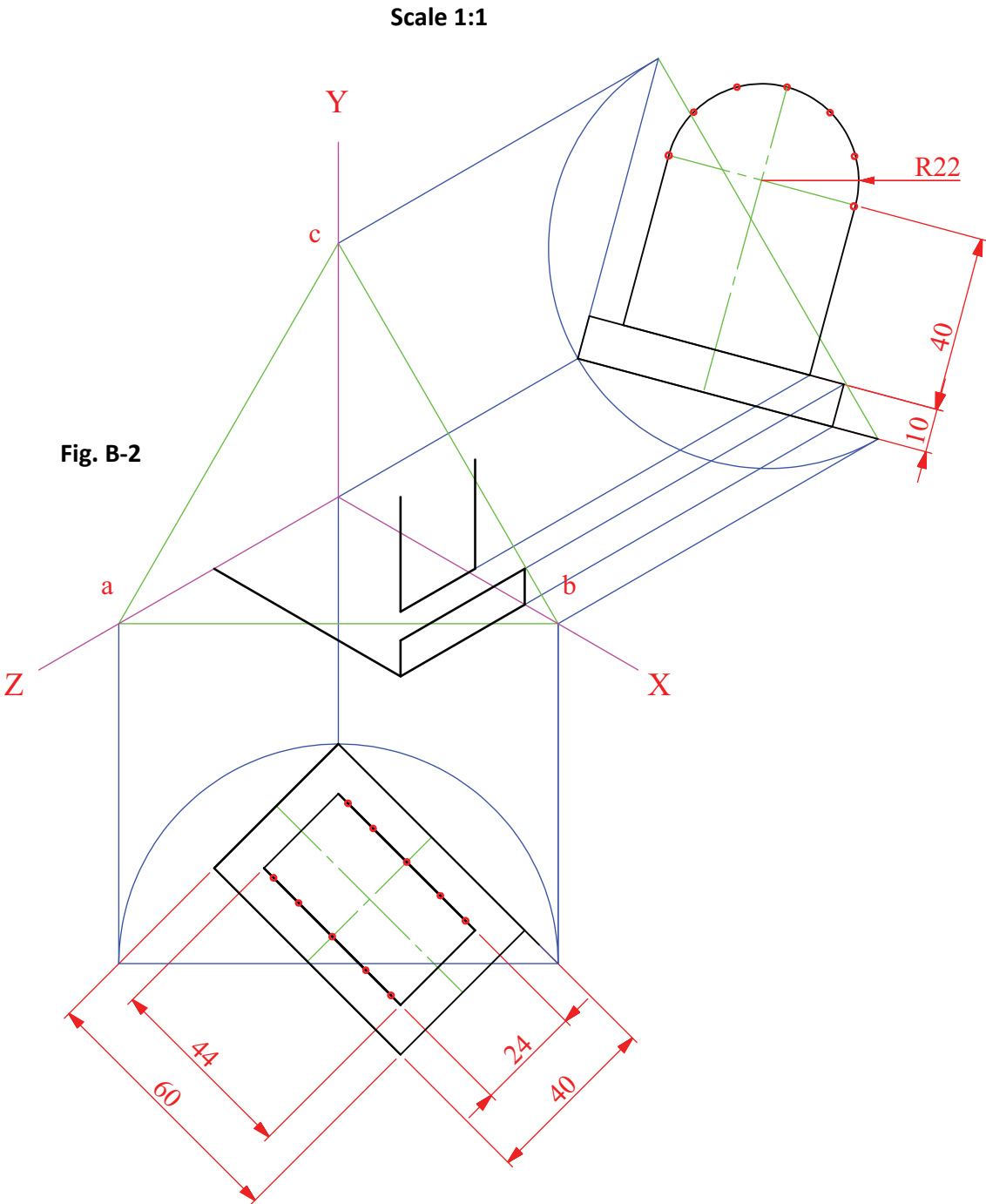
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B-2. The 3D graphic on the right shows a mantelpiece clock.

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

The elevation and plan of the clock are 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 rectangular parts of the clock.
- (d) Complete the axonometric projection of the clock by drawing the semi-circular end.



B-3. The 3D graphic on the right shows a lectern.

Fig. B-3 below shows an isometric view of a model of the lectern.

- (a) Draw an elevation of the 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 show the true shape of surface **A**.

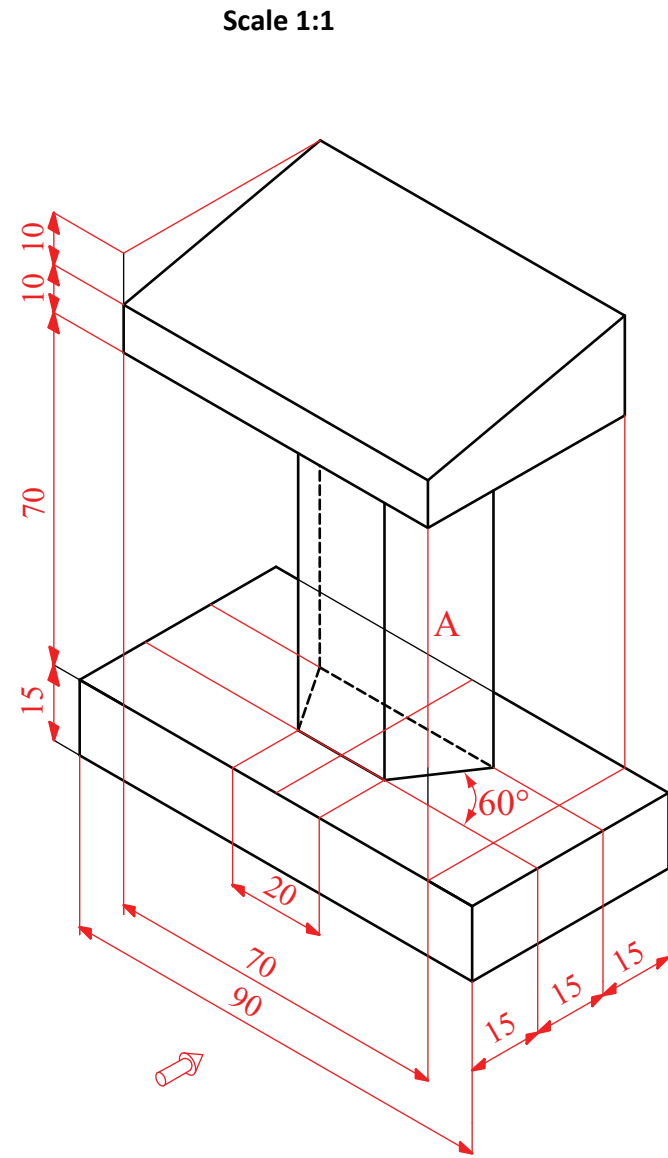


Fig. B-3



Assemblies

C-5. The graphic on the right shows a book shelf with some books which are falling over. A bookend will prevent the books from falling. Details of a book end 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 bookend.

(Any omitted dimensions may be estimated.)



Part	Name	Qty.
1	Side	1
2	Base	1
3	Support	1
4	30mm Dowel	2
5	40mm Dowel	1

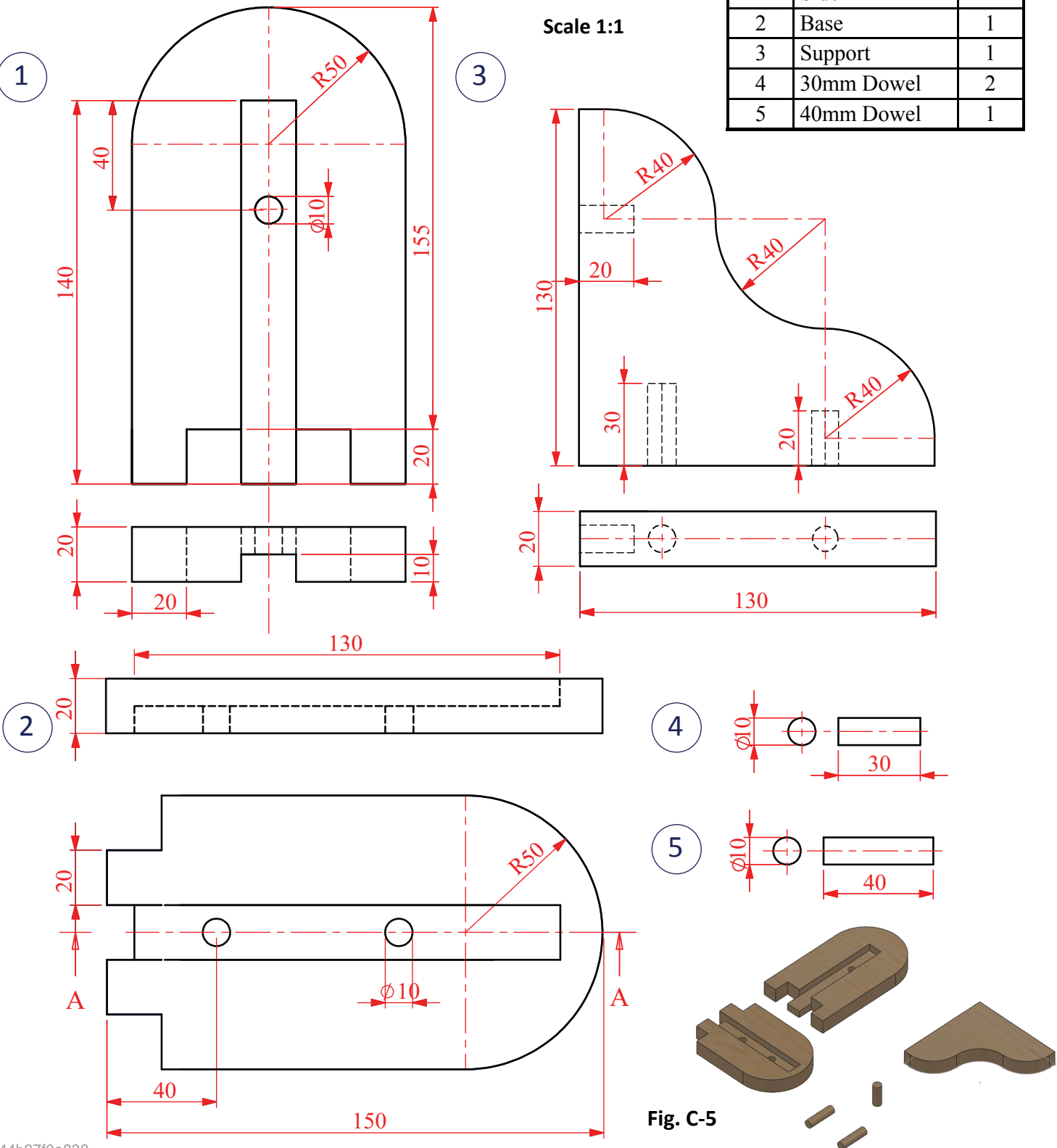


Fig. C-5

Dynamic Mechanisms

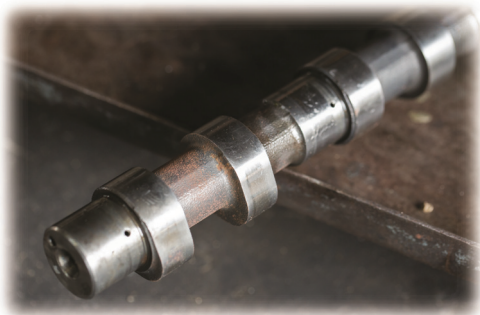
C-4. The graphic on the right shows an enlarged view of a cam mechanism from the engine of a lawnmower.

A cam, similar to the one shown, imparts the following motion to a follower:

- 0° to 150° Rise 45mm with uniform velocity
- 150° to 240° Dwell
- 240° to 360° Fall 45mm 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 a clockwise direction
- The nearest approach of the inline follower to the centre of the camshaft is 20mm
- The camshaft diameter is 20mm.

Scale 1:1



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) **CD** is the centreline of a proposed roadway which is level at an altitude of 95m. 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 sun shade in the form of a hyperbolic paraboloid.

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

- Draw the given plan and elevation of the hyperbolic paraboloid surface.
- Project an end view of the hyperbolic paraboloid surface.



Scale 1:1

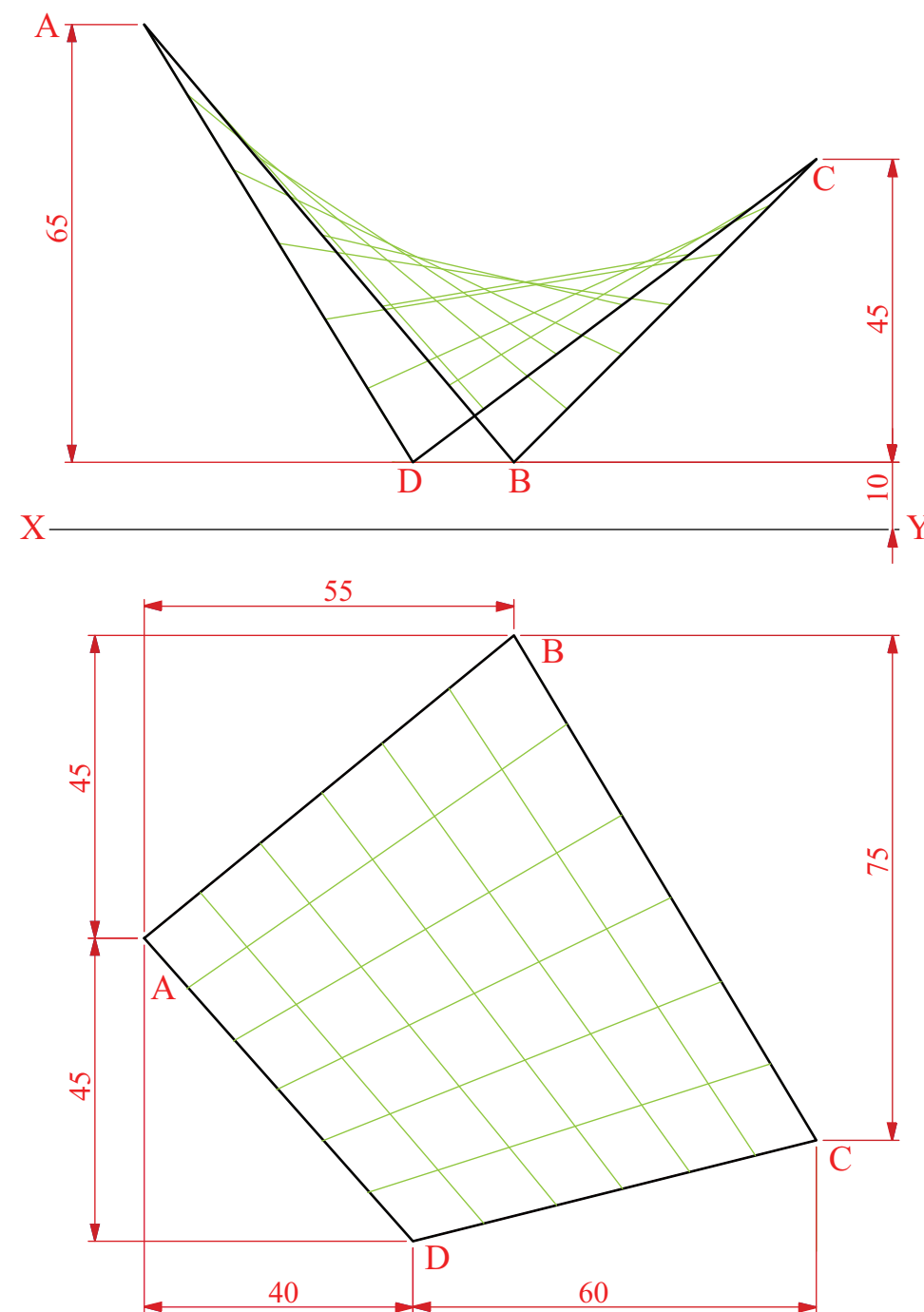


Fig. C-2

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Surface Geometry

C-3. The 3D graphic on the right shows a letter box.

The projections of a model of a similar letter box are shown in Fig. C-3 below.

- Draw the given views of the letter box.
- Project a plan of the letter box.
- Draw a one-piece surface development of the letter box.



Scale 1:1

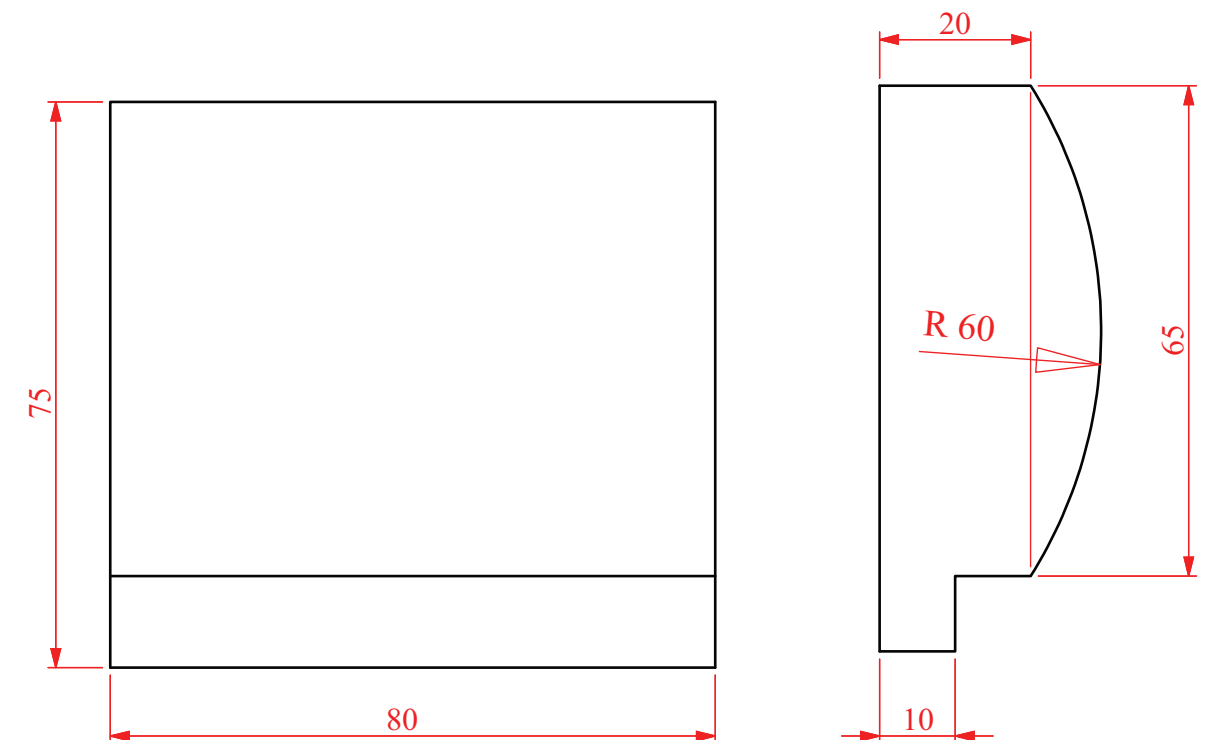


Fig. C-3

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