



Leaving Certificate Examination, 2015

Design & Communication Graphics
Ordinary Level

Section A (60 marks)

Wednesday, 17 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:

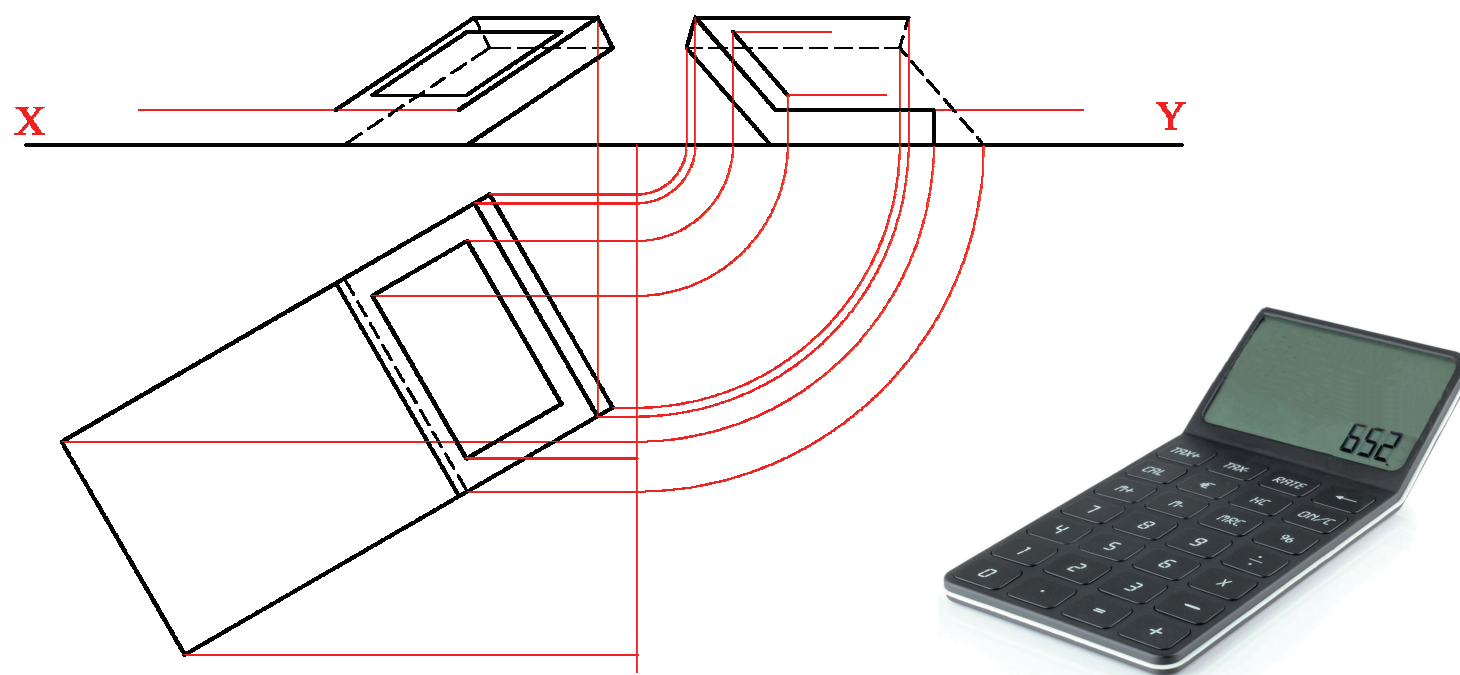
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box below and on all 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 an image of a calculator. The plan and partially completed elevation and end view are also shown.

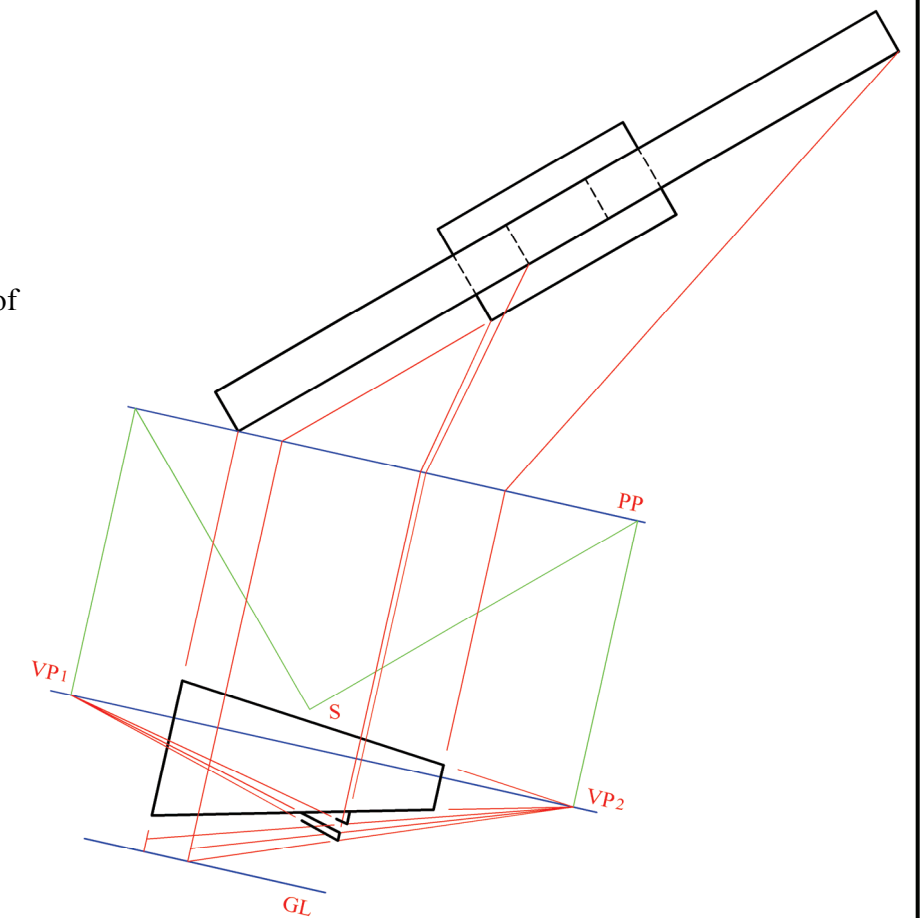
- (a) Complete the elevation of the calculator.
- (b) Complete the end view of the calculator.



A-3. The 3D graphic below shows a widescreen plasma TV on a rectangular stand.

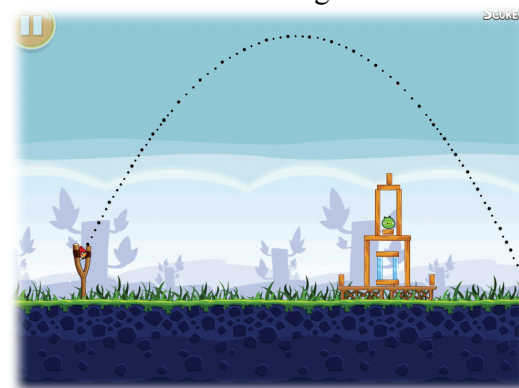
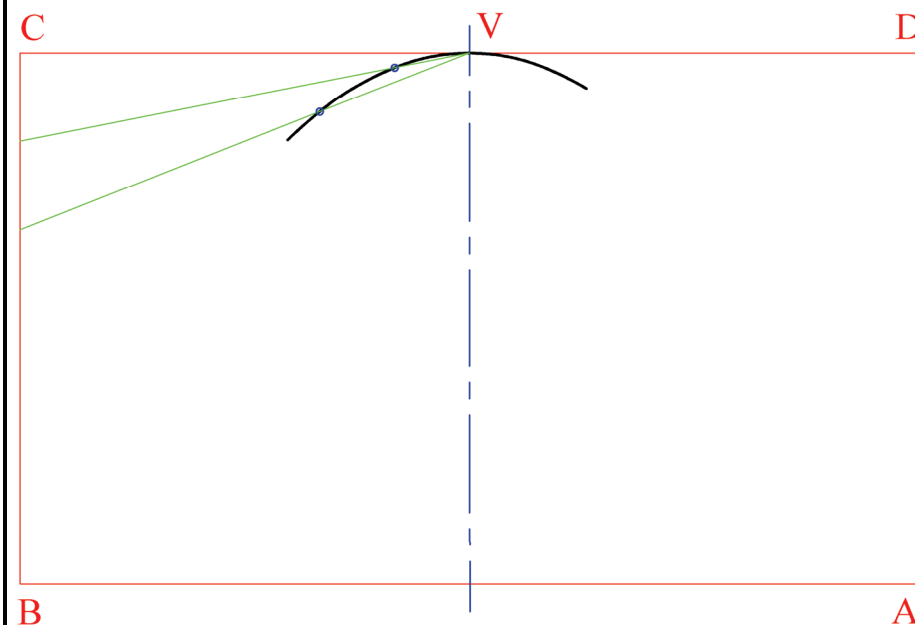
The drawing on the right shows the plan and a partially completed perspective drawing of the TV.

Complete the perspective drawing of the TV and stand.



A-2. The graphic on the right shows an image from the 'Angry Birds' computer game. The curve is in the shape of a parabola. The drawing below shows a portion of a parabola inscribed in a rectangle ABCD. V is the vertex of the parabola.

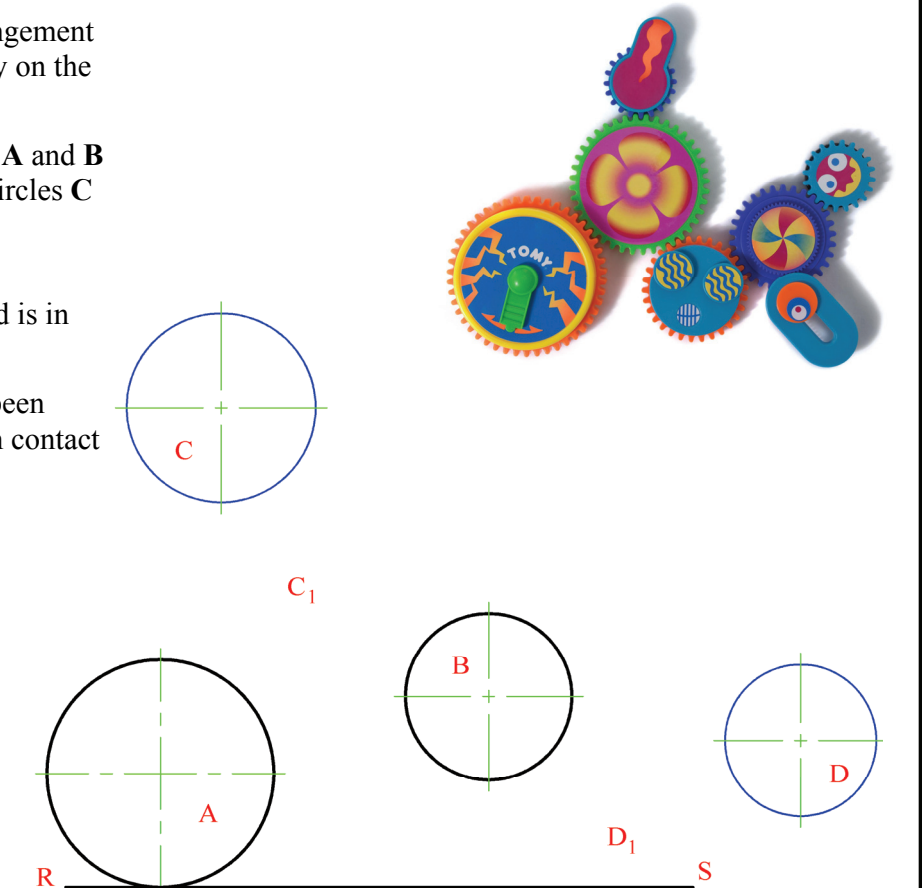
- (a) Locate the remaining points on the parabola.
- (b) Draw the complete parabola.



A-4. The drawing below shows an arrangement of circles similar to those in the toy on the right.

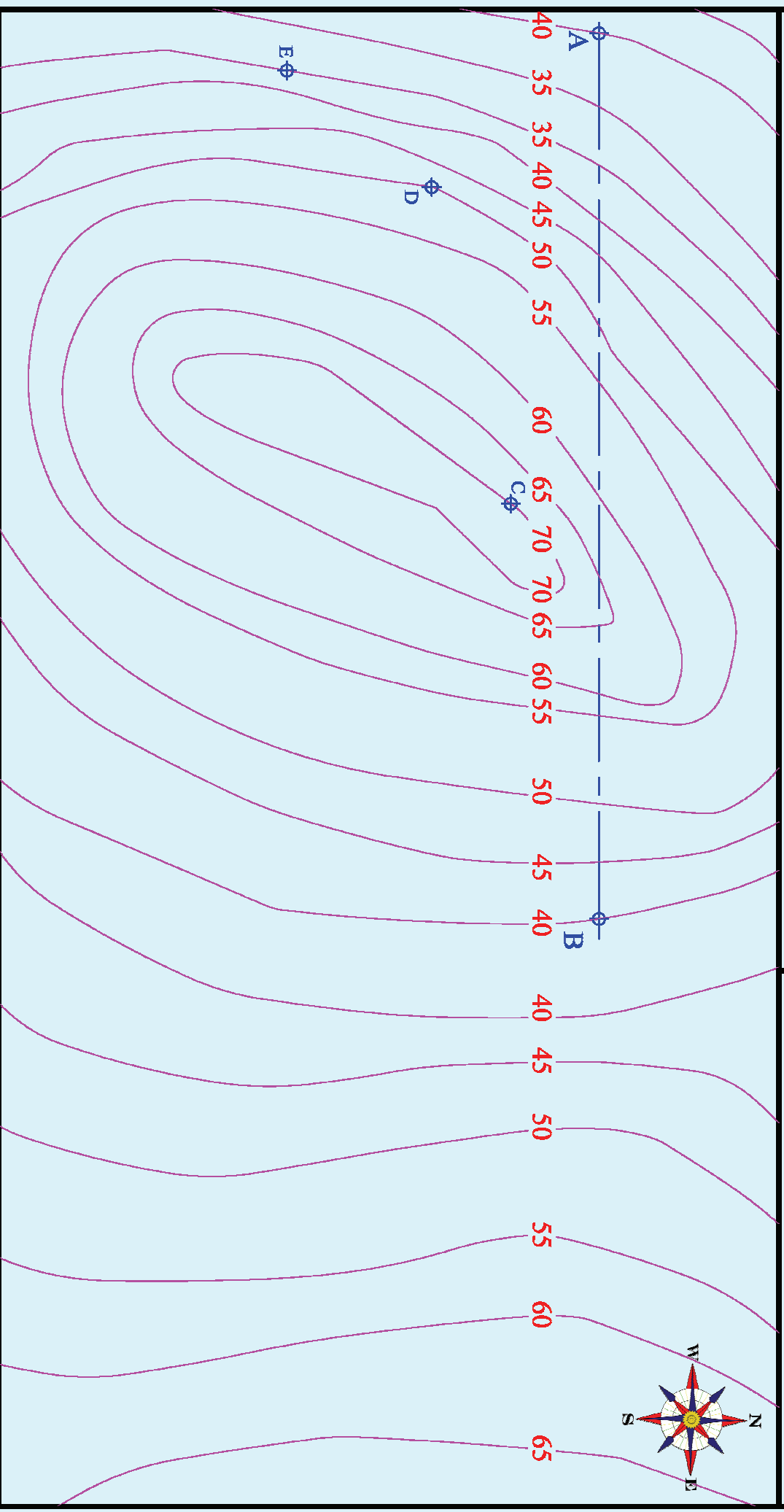
The horizontal line RS and circles A and B are in fixed positions as shown. Circles C and D are free to move.

- (a) Redraw circle C when it has been moved to position C_1 and is in contact with circles A and B.
- (b) Redraw circle D when it has been moved to position D_1 and is in contact with circle B and the line RS.
- (c) Show all points of contact.



**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, 2015

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

Wednesday, 17 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 an outline design for a modern school building. The main brick building intersects a central concrete tower as shown.

Fig. B-1 shows the incomplete projections of the school building.

- (a) Draw the given views and show all lines of interpenetration.
- (b) Draw an end view of the school building.

Scale 1:1

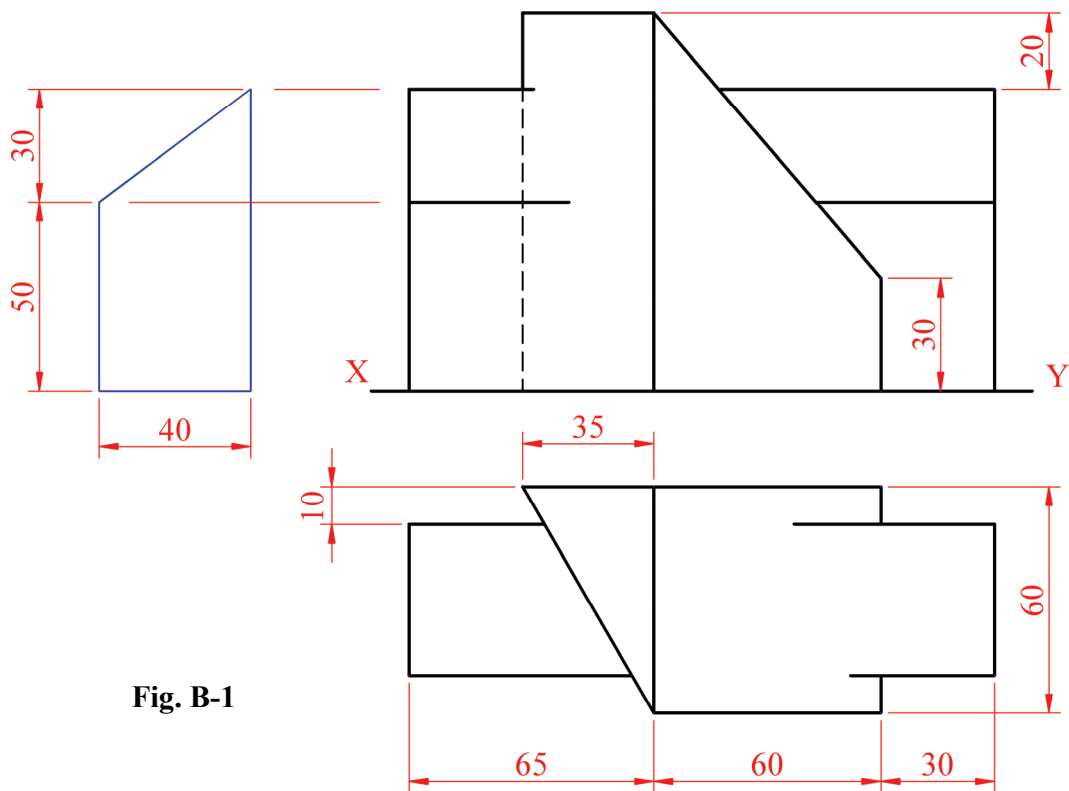
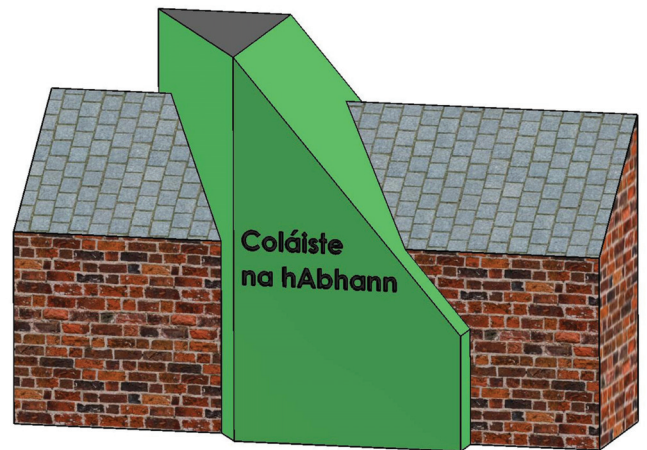


Fig. B-1

B-2. The 3D graphic on the right shows a dog kennel.

Fig. B-2 below shows an incomplete isometric projection of the kennel. The elevation and plan of the kennel 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 sides and roof of the kennel.
- (d) Draw the axonometric projection of the front of the kennel to include the semi-circular opening.



Scale 1:1

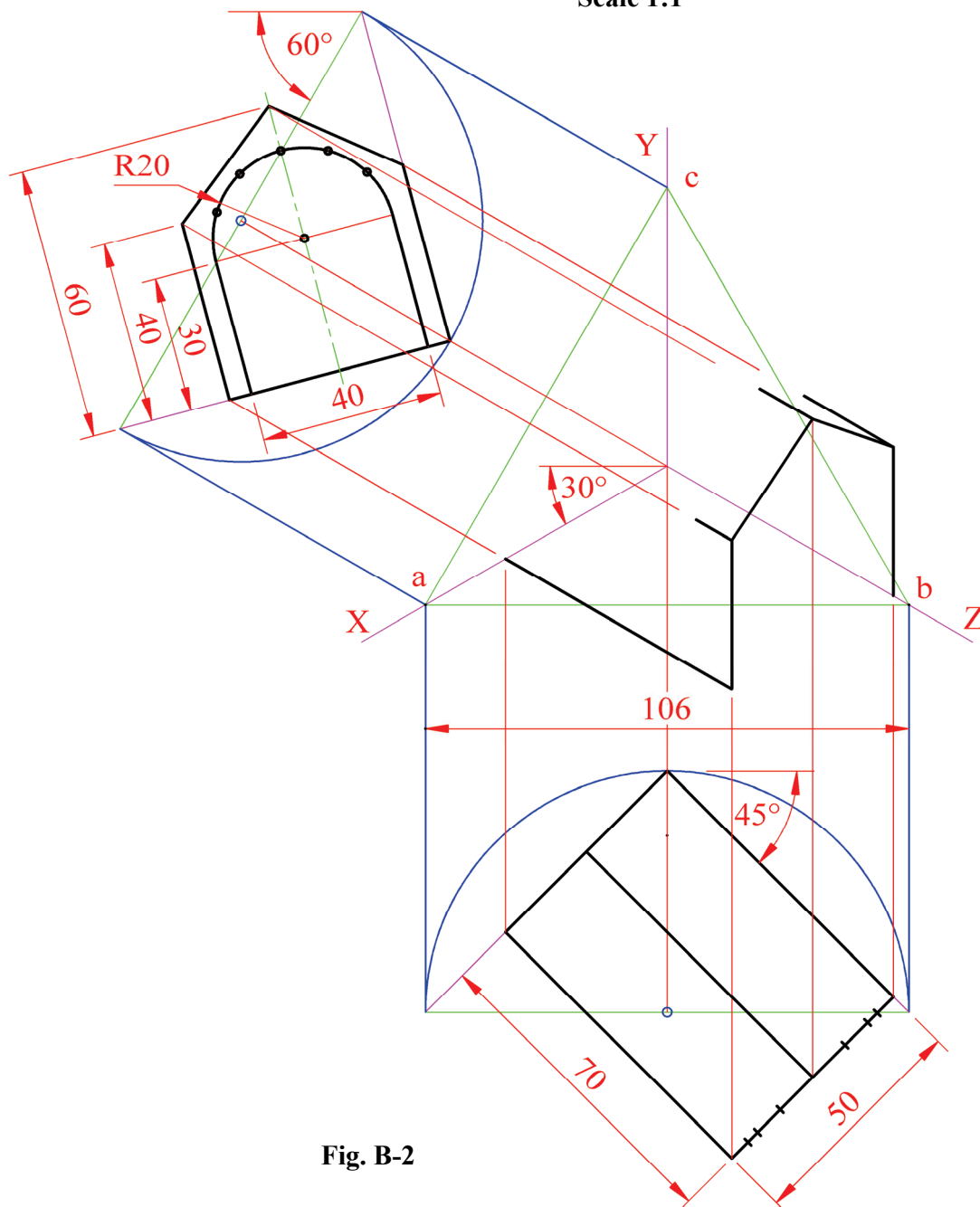


Fig. B-2

B-3. The 3D graphic on the right shows a delicatessen counter with a sandwich display unit on top.

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

- (a) Draw an elevation of the structure 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

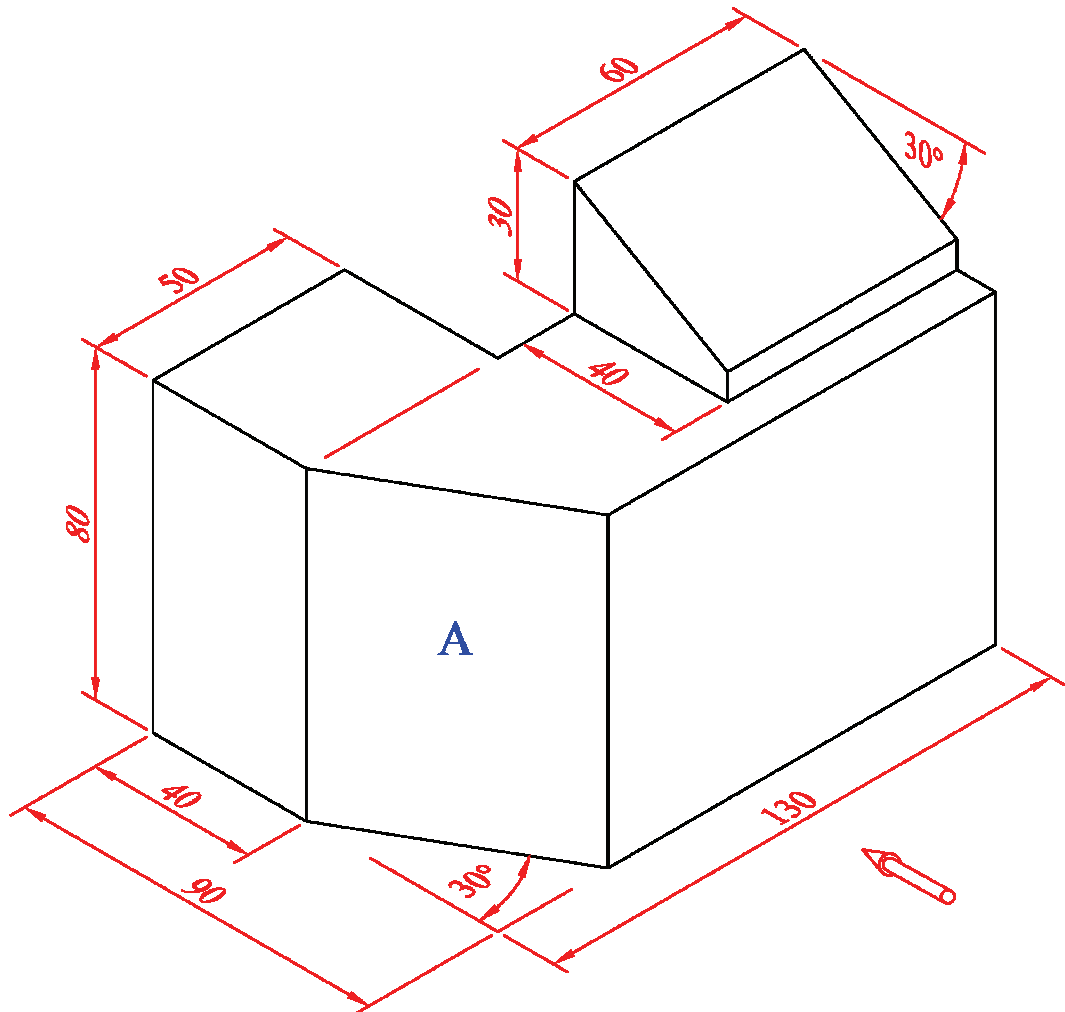


Fig. B-3

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 5 metre vertical intervals.
- (a) On the drawing supplied, draw a vertical section (profile) on the line **AB**.
 - (b) **C**, **D** and **E** are outcrop points on the top surface of a stratum of ore.
Determine the strike and dip of the stratum.
 - (c) The stratum has a thickness of 10 metres. In your auxiliary view, which shows the dip, draw the bottom surface of the stratum.

Scale 1:1000

Structural Forms

C-2. The graphic on the right shows the Glasnevin Museum in Dublin, which has a modern roof structure. Hyperbolic paraboloid surfaces are often used in structures such as this.

Fig. C-2 shows the projections of a hyperbolic paraboloid surface **ABCD**, the outline of which is a parallelogram in elevation as shown.

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

Scale 1:1

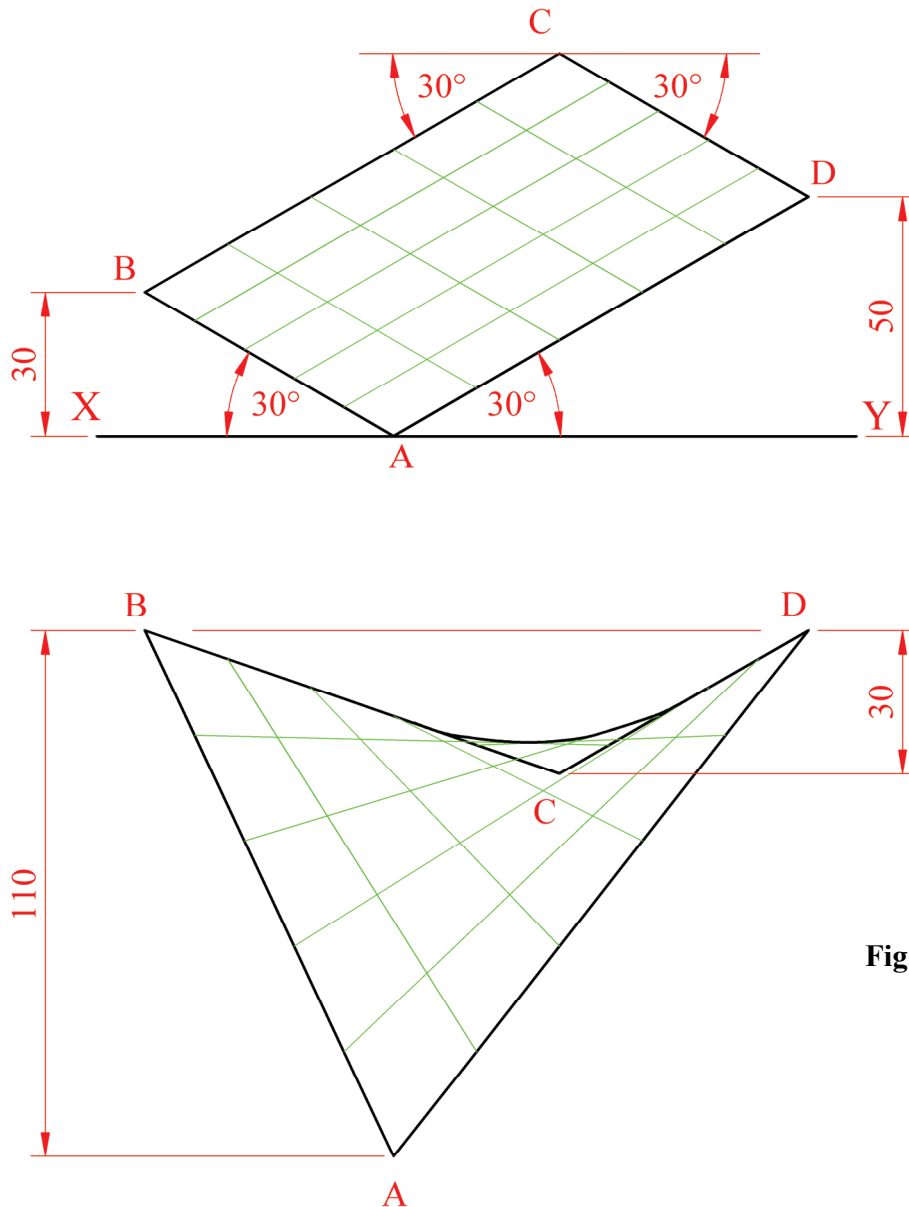


Fig. C-2

Surface Geometry

C-3. The 3D graphic on the right shows a kit bag with a sports logo.

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

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

Ignore the logo and the handle for the purpose of your drawing.



Scale 1:1

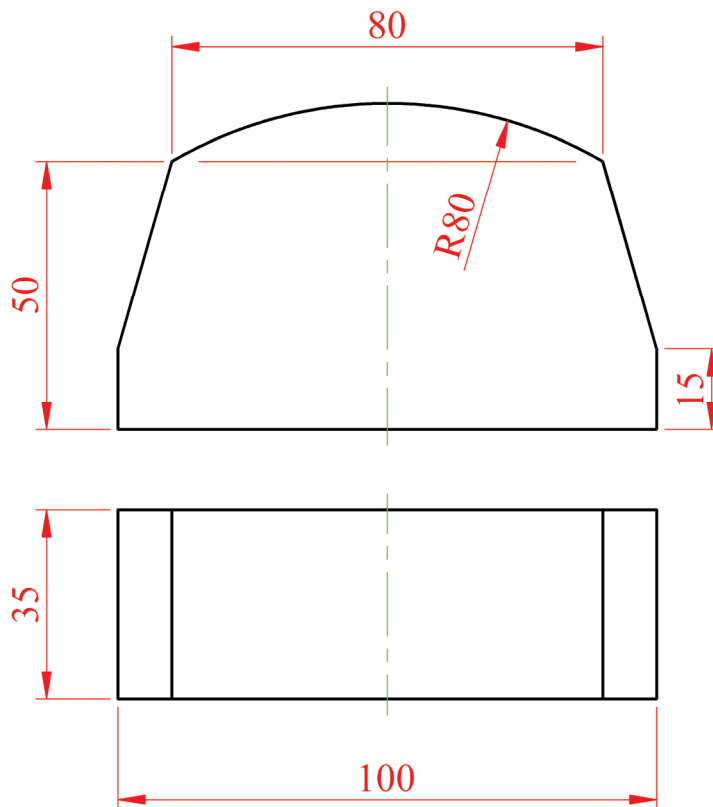


Fig. C-3

Dynamic Mechanisms

C-4. The image on the right shows a clamping device used in rock climbing.

A cam mechanism is used in the device in order to grip into cracks in the rock face.

The 3D graphic below shows a similar cam which imparts the following motion to an inline knife edge follower:

- 0° to 120° Rise 60mm with uniform velocity
- 120° to 180° Dwell
- 180° to 360° Fall 60mm with simple harmonic motion

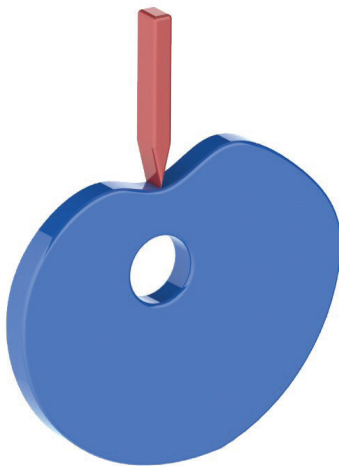
(a) Draw the displacement diagram for the cam.

(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 40mm
- The camshaft diameter is 18mm.

Scale 1:1



Assemblies

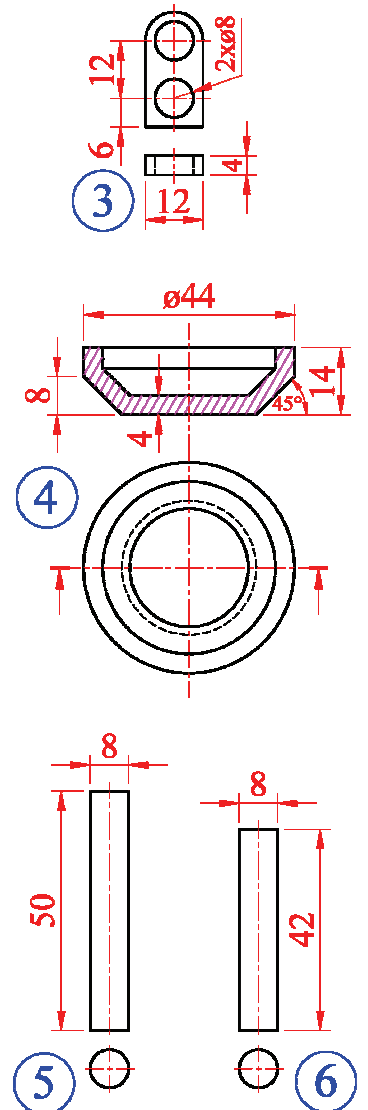
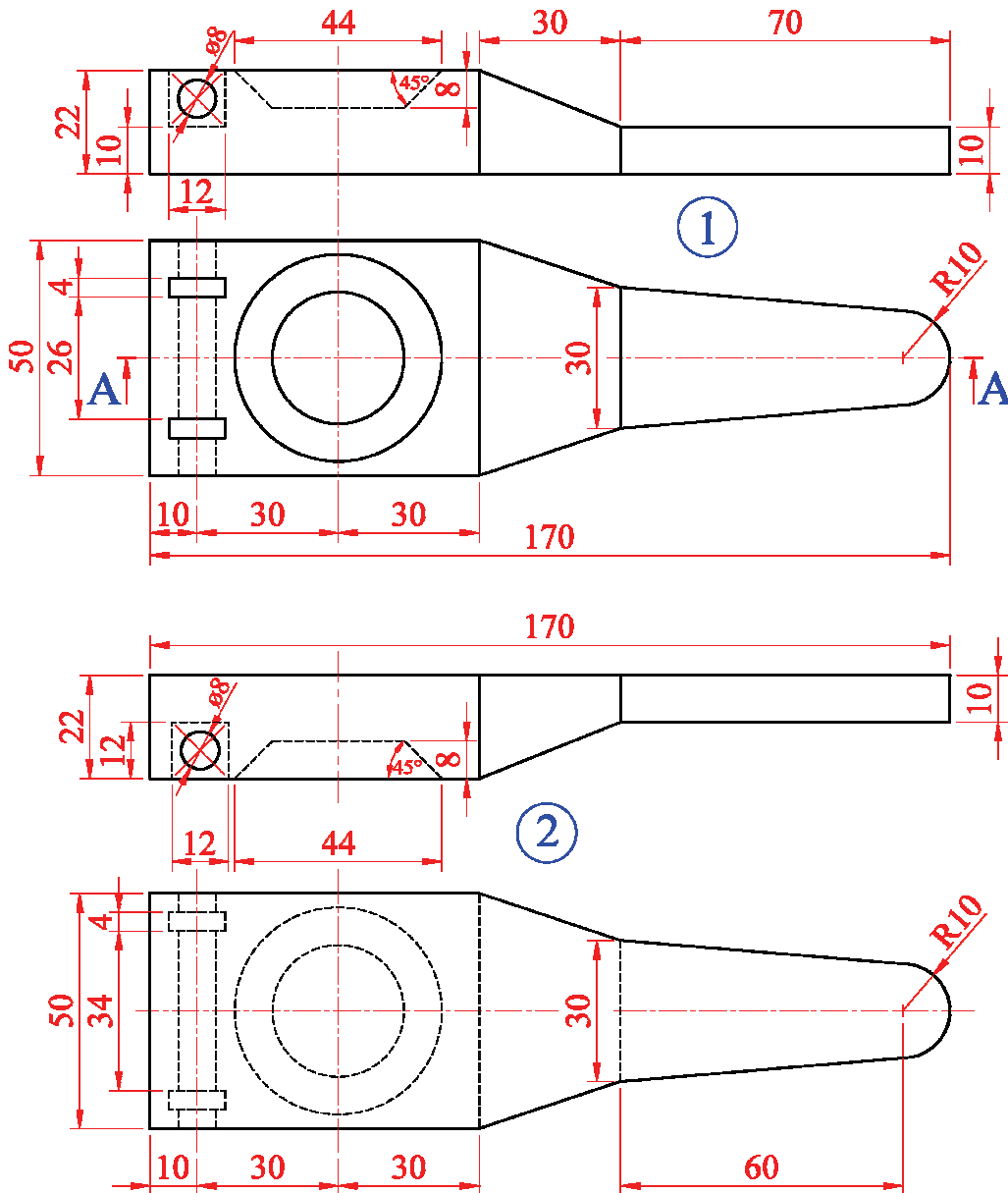
C-5. Details of a *Handheld Nut Cracker*, as shown on the right, are given in Fig. C-5 below.

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

Draw the **sectional elevation** A-A of the assembled Nut Cracker, in the **fully closed** position.

(Any omitted dimensions may be estimated.)

Scale 1:1



Part	Name	Qty.
1	Bottom Handle	1
2	Top Handle	1
3	Brass Pin Holder	4
4	Metal Jaw	2
5	50mm Pin	2
6	42mm Pin	1



Fig. C-5

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