



Leaving Certificate Examination, 2014

Design & Communication Graphics

Ordinary Level

Section A (60 marks)

Wednesday, 18 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:

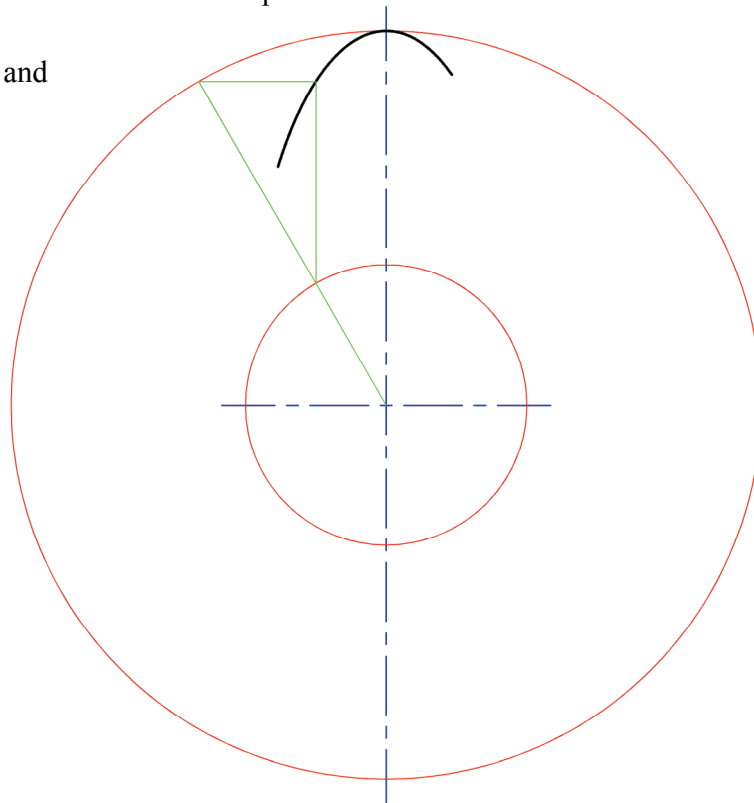
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box below and on all 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 pair of earrings based on elliptical shapes. The drawing on the right shows the major and minor axes of an ellipse. A portion of the curve is already drawn.

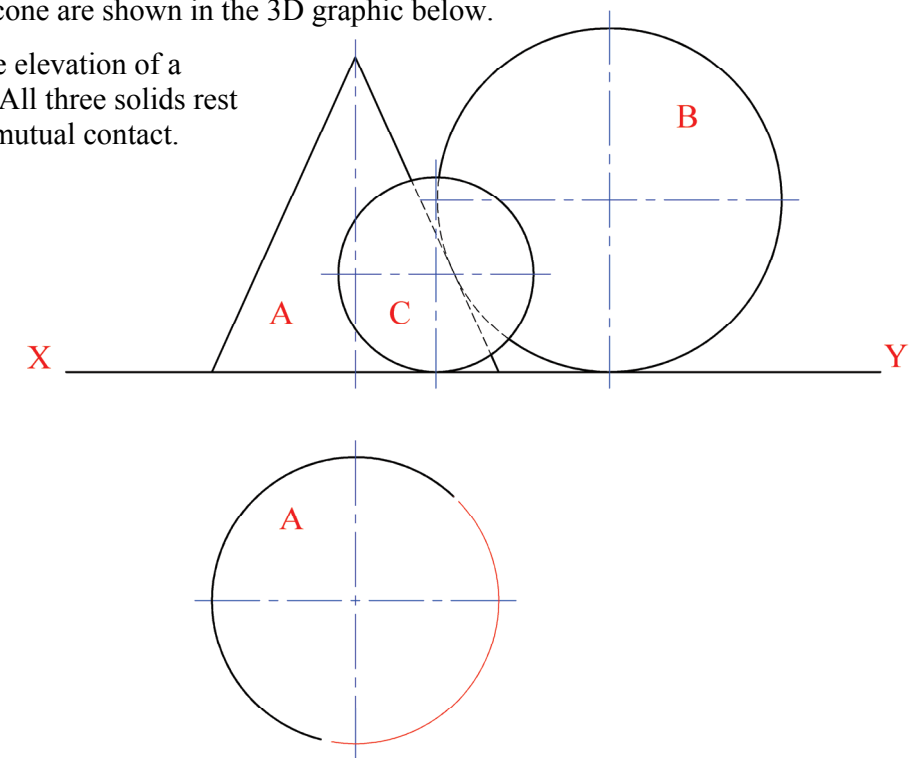
- (a) Locate the remaining points on the curve and draw the ellipse.
- (b) Locate the focal points of the ellipse.



A-3. Toys in the form of spheres and a cone are shown in the 3D graphic below.

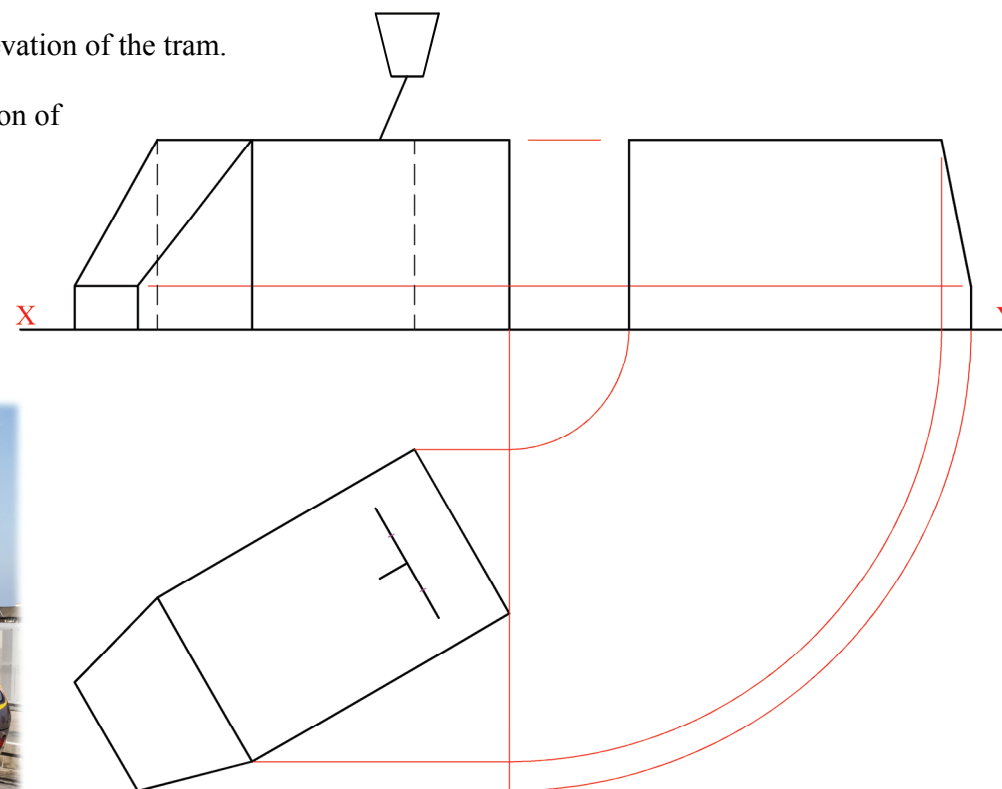
The drawing on the right shows the elevation of a cone **A** and two spheres, **B** and **C**. All three solids rest on the horizontal plane and are in mutual contact. The plan of cone **A** is also shown.

- (a) Draw the plan of sphere **B**.
- (b) Draw the plan of sphere **C**.



A-2. The 3D graphic below shows one section of a *Luas* tram. The plan, elevation and partially completed end elevation of the outline of the tram are shown on the right.

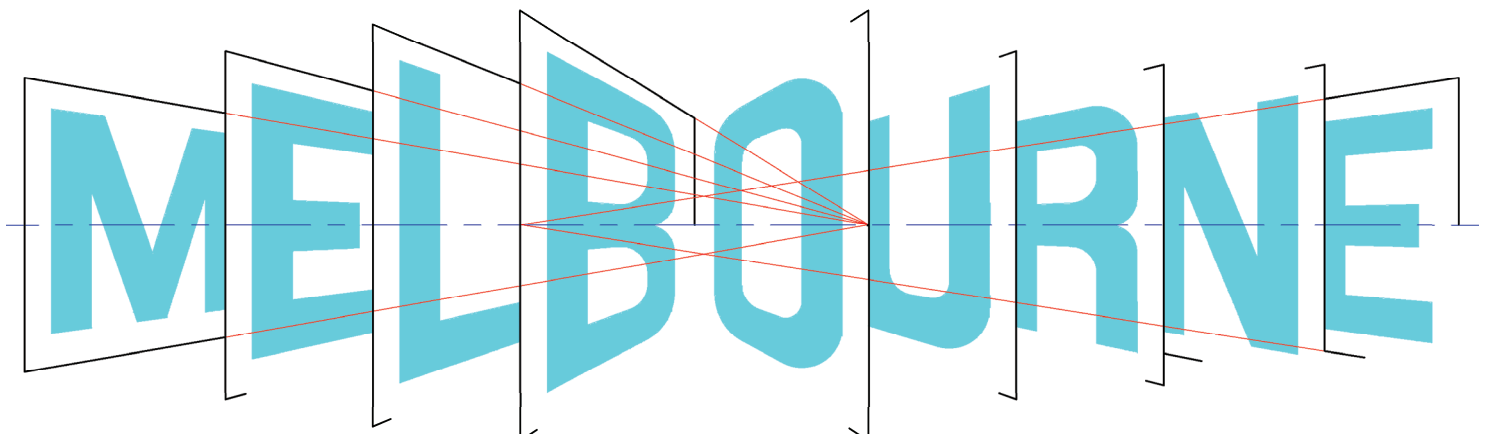
- (a) Complete the end elevation of the tram.
- (b) Draw the end elevation of the power supply connector on the top of the tram.



A-4. The 3D graphic on the right shows the “MELBOURNE” logo displayed on a billboard during the *Australian Open* tennis championship. The logo is designed to look like pages from a book.

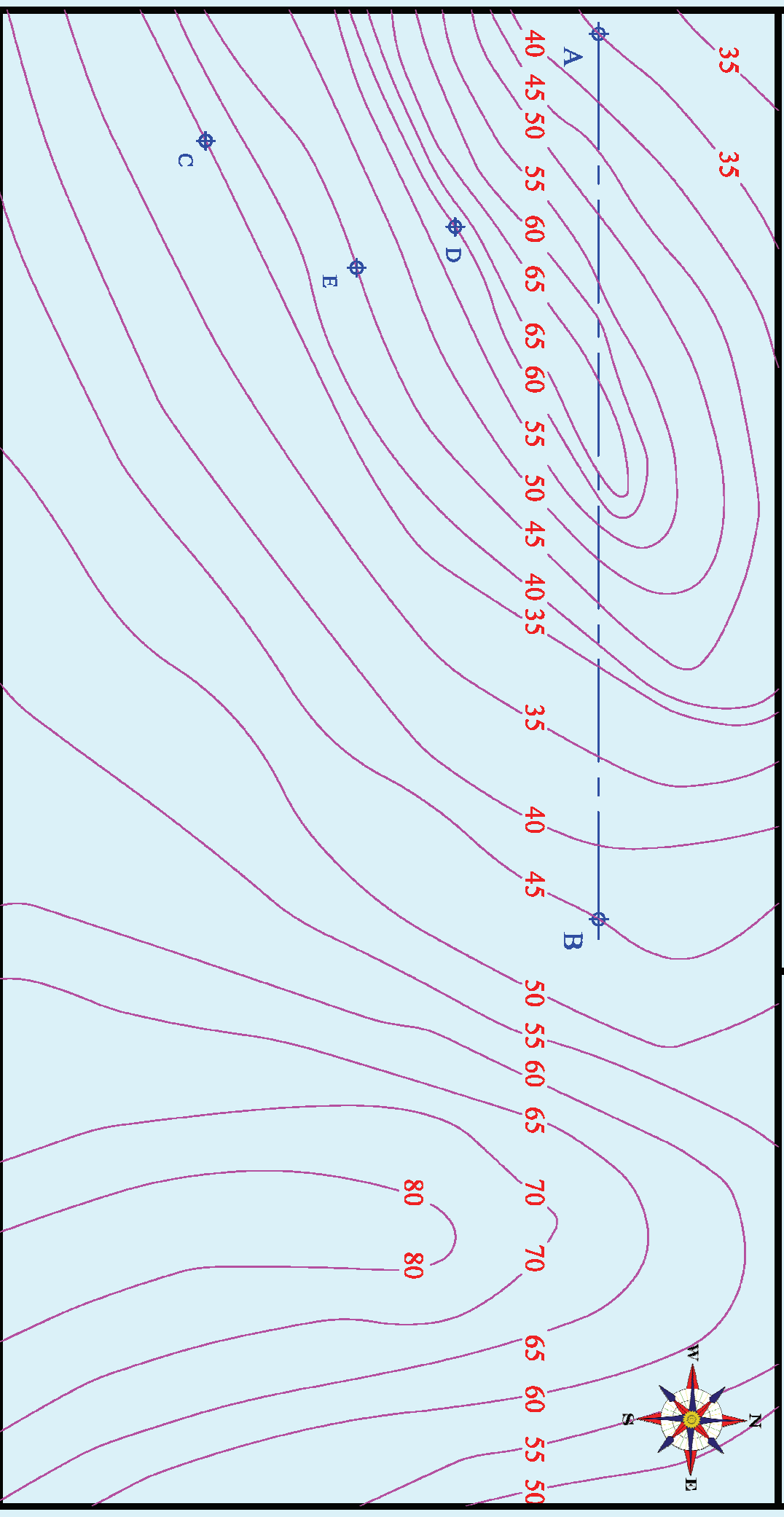
The partially completed drawing below shows how the logo is constructed using two vanishing points.

Complete the drawing.



**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, 2014

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

Wednesday, 18 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.*

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

Fig. B-1 below shows an incomplete isometric projection of the bottle. The elevation and plan of the bottle are also shown in their required positions.

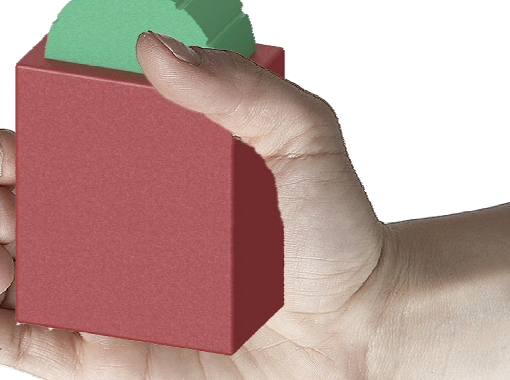
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- A hand is shown holding a red cube. On top of the cube is a green dome-shaped object with vertical ridges, resembling a stylized mountain or a specific architectural feature. The background is plain white.

Figure B-1 is a descriptive geometry drawing showing the projections of a line segment and a rectangular plate. The drawing is divided into three main views: a top view, a front view, and a side view, all constructed using descriptive geometry techniques.

Top View (Bottom): Shows a rectangular plate with dimensions 100 by 60. The plate is tilted at a 45° angle relative to the horizontal axis. The center of the plate is marked with a blue dot. The dimensions 100, 60, and 45° are indicated with red arrows and text. The plate is divided into four quadrants by dashed lines.

Front View (Top): Shows a line segment of length 100, tilted at a 30° angle relative to the horizontal axis. The segment is labeled 'a' and 'b' at its ends. The dimensions 100 and 30° are indicated with red arrows and text.

Side View (Right): Shows a rectangular plate with dimensions 100 by 60, tilted at a 60° angle relative to the horizontal axis. The plate is labeled 'R20' at its top right corner. The dimensions 100, 60, and 60° are indicated with red arrows and text.

Coordinate System: The drawing includes a coordinate system with axes X, Y, and Z. The X-axis is horizontal, the Y-axis is vertical, and the Z-axis is diagonal. The origin is marked with a blue dot.

Construction: The drawing uses various construction lines (green, blue, red) to project the object from one view to another. The top view is projected from the front view, and the side view is projected from the front view. The dimensions and angles are used to define the object's geometry.

Fig. B-1

B-2. The 3D graphic on the right shows a structure in the form of a rectangular prism. A tunnel has been cut through the structure to accommodate a motorway as shown.

Fig. B-2 below shows the plan and incomplete elevation of the structure.

- (a) Draw the given plan and elevation of the structure and tunnel showing all lines of interpenetration.
- (b) Draw an end view of the structure.

Scale 1:1

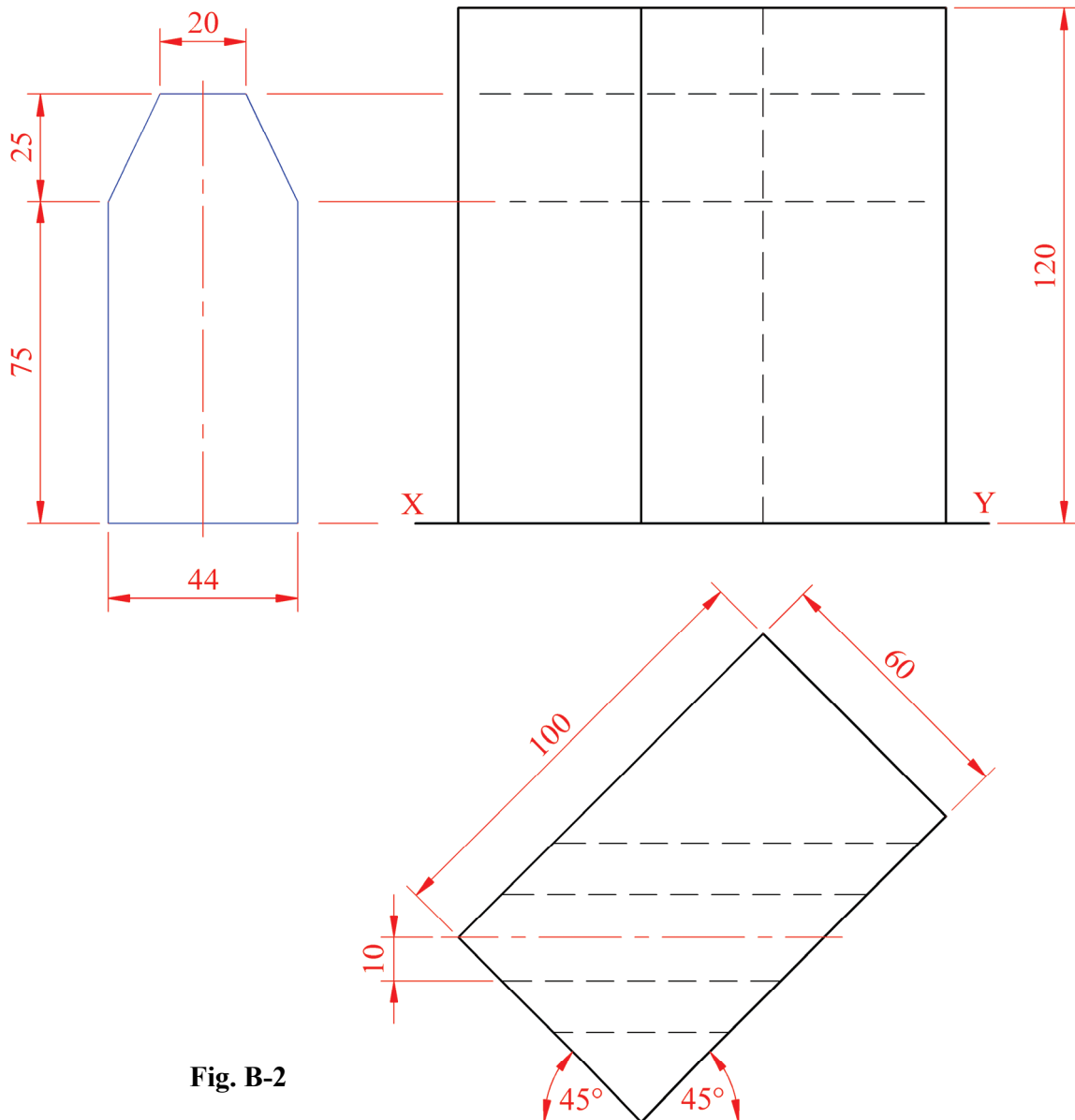
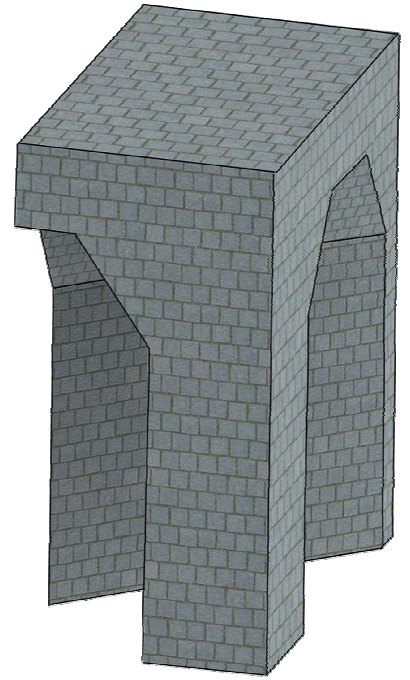


Fig. B-2

B-3. The 3D graphic on the right shows the outline of a house and conservatory.

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

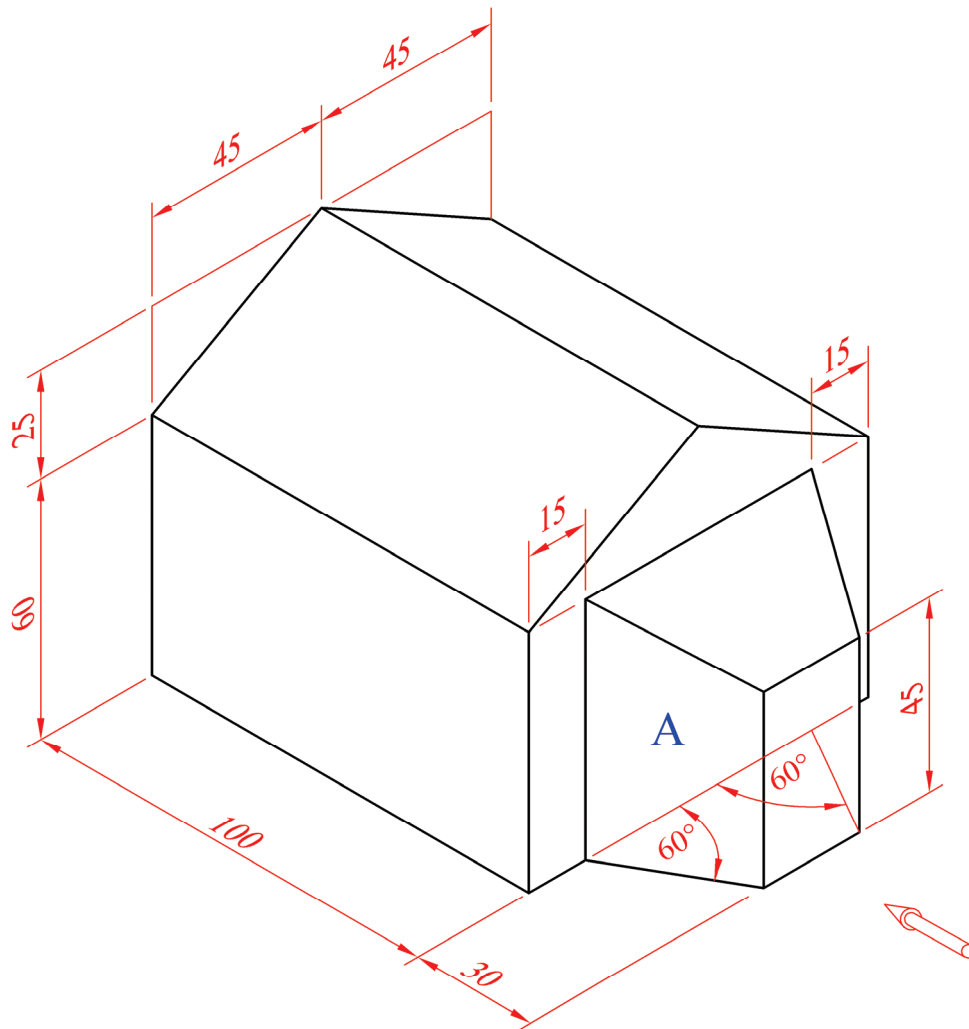
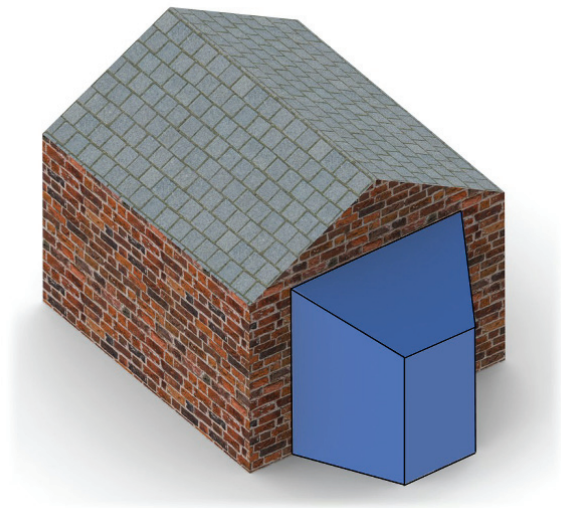


Fig. B-3

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 surface of a stratum of ore.
Determine the strike and dip of the stratum.

Scale 1:1000

Structural Forms

C-2. The graphic on the right shows a multimedia player for streaming TV over the Internet. The hyperbolic paraboloid shape on the top of the unit is designed to prevent users from placing objects on it.



Fig. C-2 shows the projections of a typical hyperbolic paraboloid surface, **ABCD**, which is rectangular in plan.

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

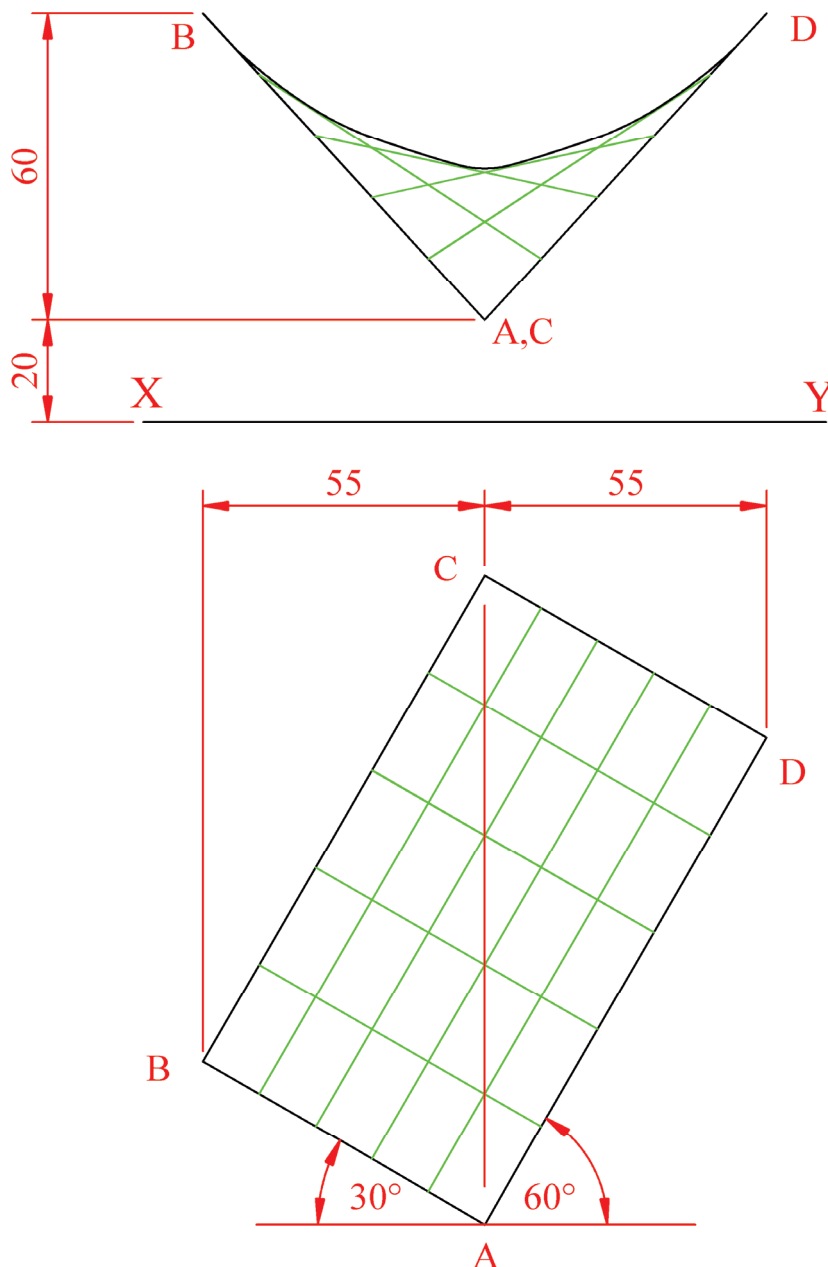


Fig. C-2

Surface Geometry

C-3. The 3D graphic on the right shows a headrest for a sports car. The headrest is covered in leather.

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

- (a) Draw the given views.
- (b) Draw a one-piece surface development of the leather cover for the headrest.

Scale 1:1

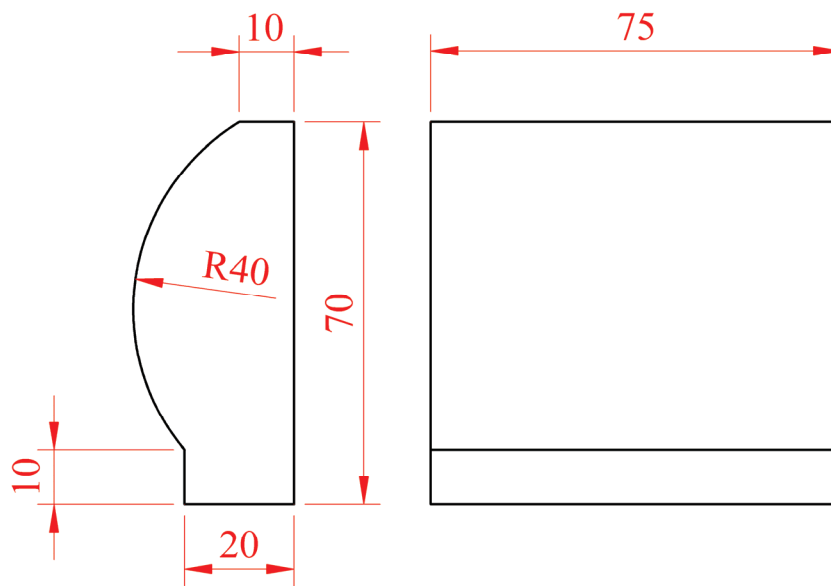


Fig. C-3

Dynamic Mechanisms

- C-4. (a)** A Piston, like the one shown in the 3D graphic on the right, is often found in machines.

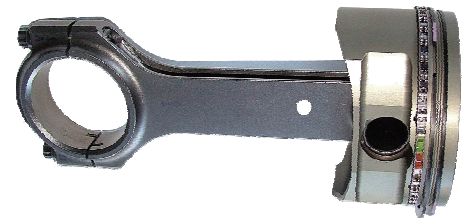


Fig. C-4(a) below is a line-diagram representation of a piston mechanism, consisting of a crank and a connecting rod which are pin jointed at **P**.

Crank **OP** rotates anticlockwise about **O**, as shown, for one revolution and point **R**, at the end of the connecting rod, moves along the horizontal axis.

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

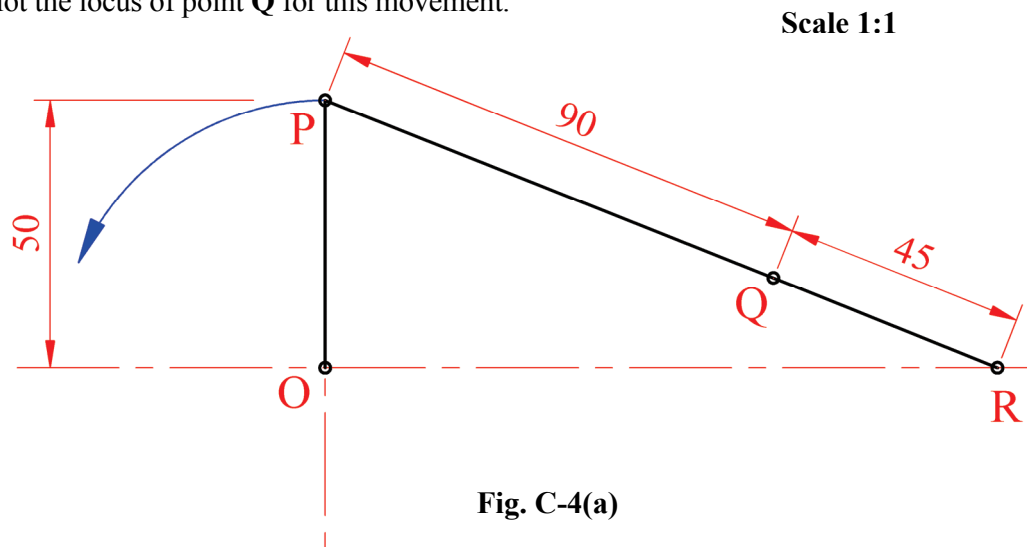


Fig. C-4(a)

- (b)** The 3D graphic below shows a helical sculpture which was unveiled in the Botanic Gardens in Dublin in 2013 to mark the 60th anniversary of the discovery of DNA by Dr James Watson, a scientist of Irish descent.

Fig. C-4(b) on the right shows the projections of a partially completed helix.

The helix moves from point **S** to point **T** in one revolution. Draw the projections of the cylinder and complete the elevation of the helix.

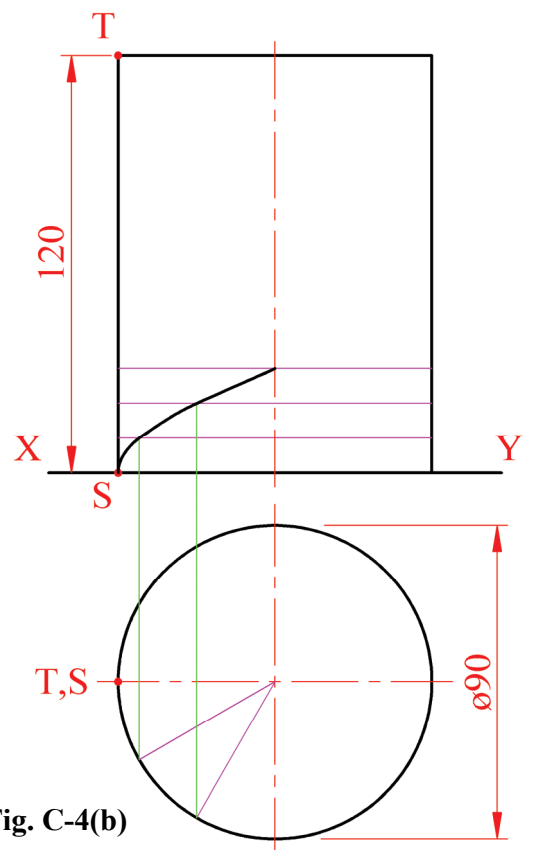


Fig. C-4(b)

Assemblies

C-5. Details of a Hitch Mechanism for a toy tractor and trailer, 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 elevation of the assembled Hitch Mechanism.

(Any omitted dimensions may be estimated.)

Scale 1:1

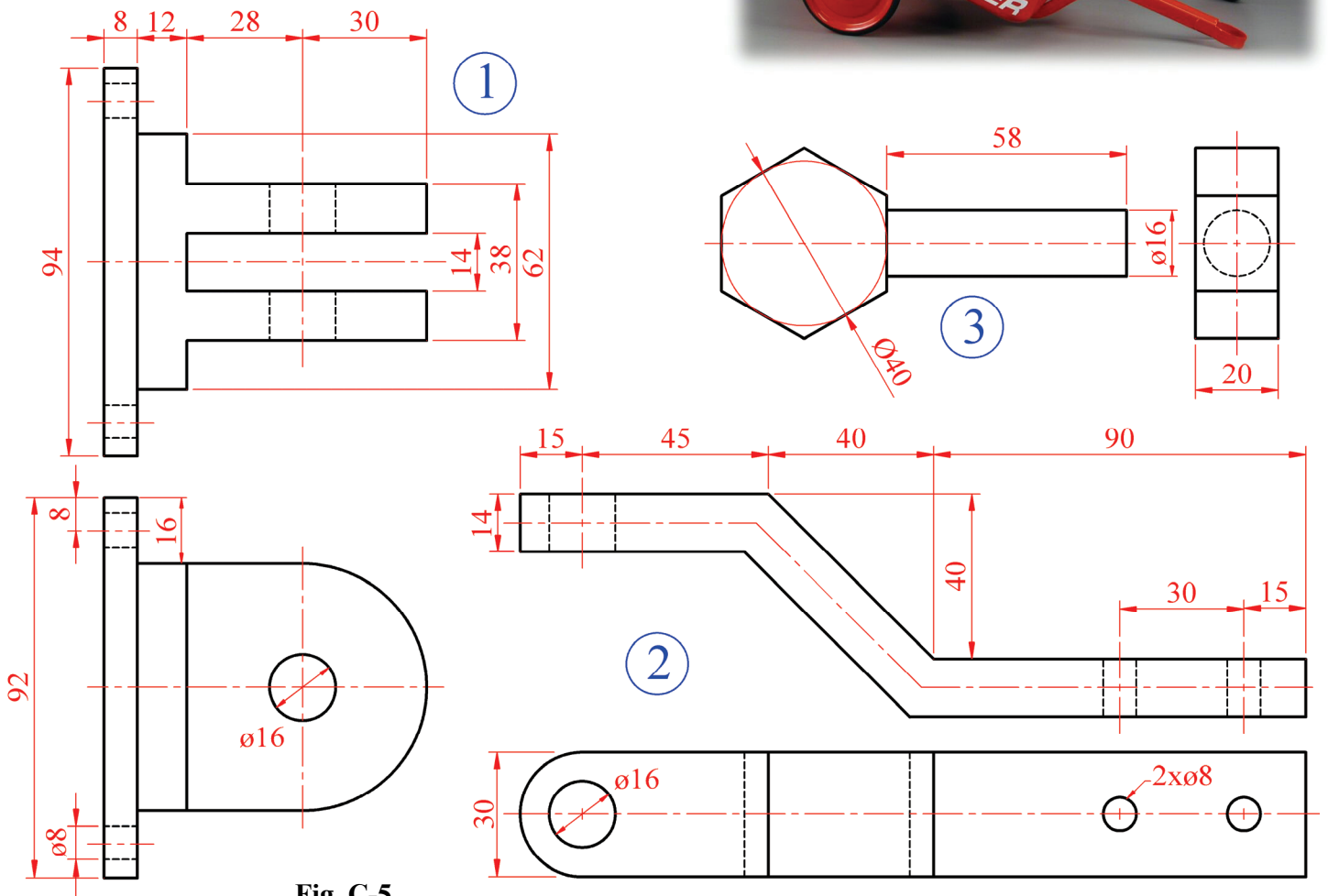
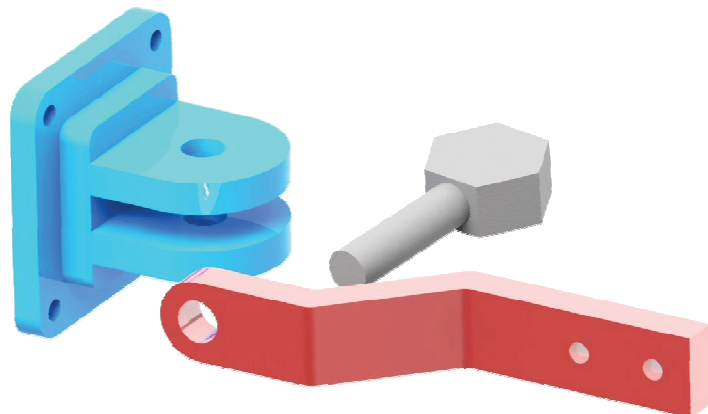


Fig. C-5

Part	Name	Qty.
1	Tractor Bracket	1
2	Trailer Hitch	1
3	Connecting Pin	1



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