



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination, 2021

Design & Communication Graphics
Higher Level

Section A (60 marks)

Centre No.

Thursday, 24 June
Morning, 9:30 - 12:30

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**
and
SECTION C
- Eight questions are presented.
 - Answer **any two** on drawing paper.
 - All questions in Section B and Section C carry **60 marks** each.

General Instructions:

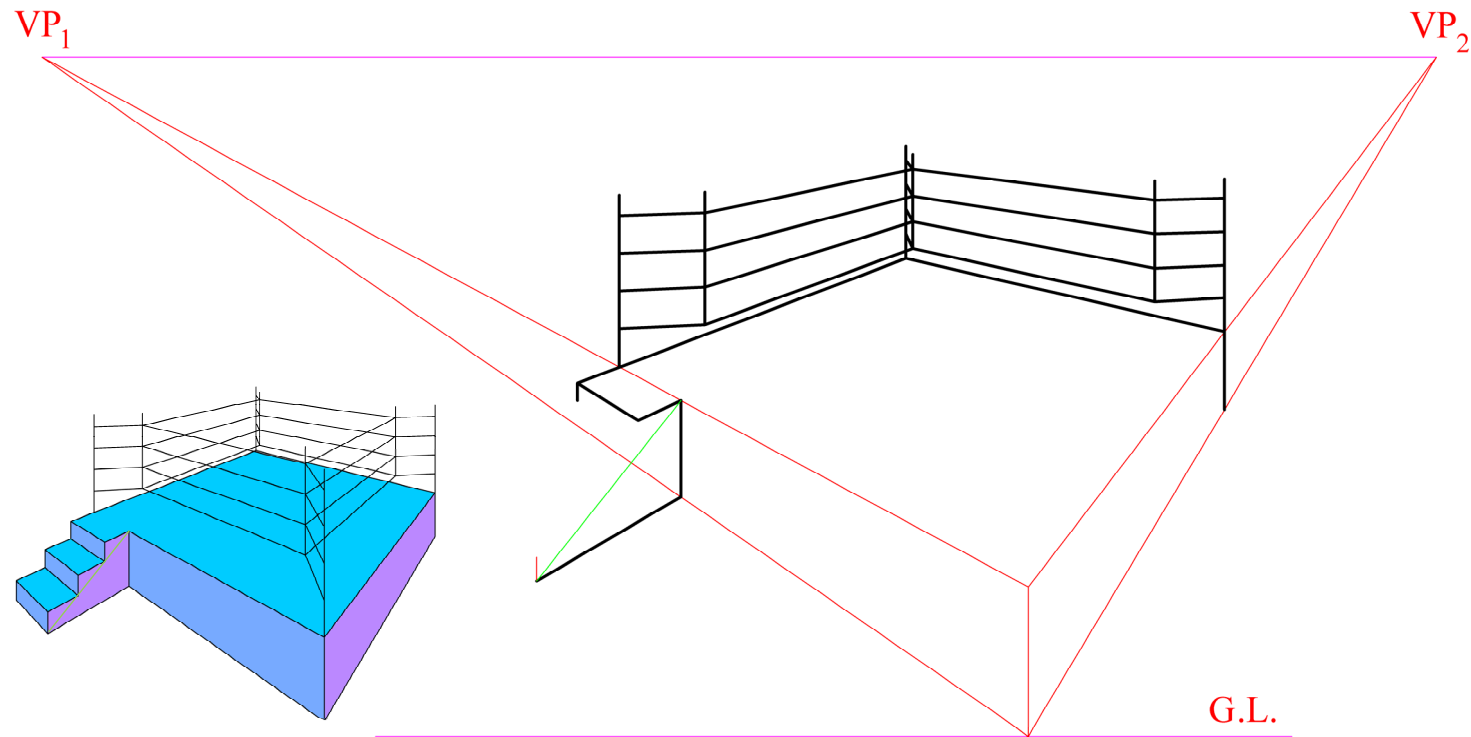
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box below and on all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

Examination Number

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

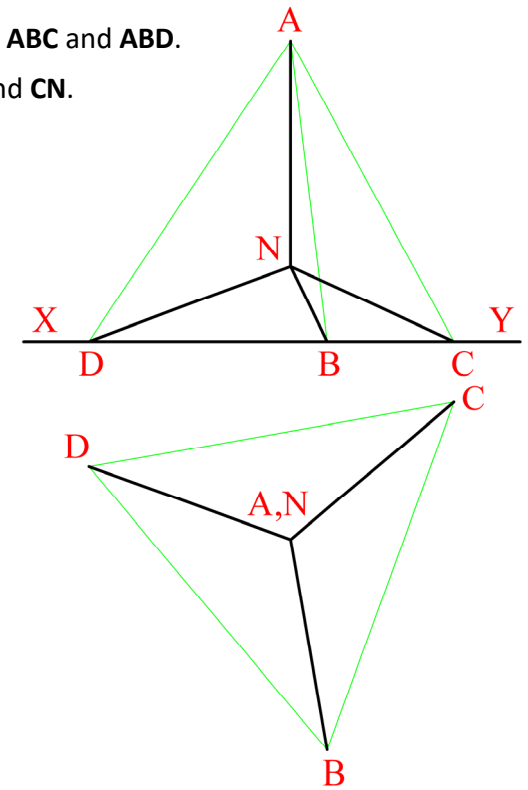
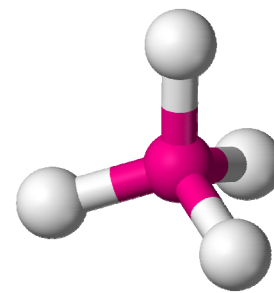
A-1. The 3D graphic shows a boxing ring with steps. Shown below is an incomplete perspective drawing of the ring and steps. The positions of the ground line and the vanishing points are given.

- (a) Complete the perspective drawing of the boxing ring.
- (b) The steps are of equal height. Complete the perspective drawing of the steps.



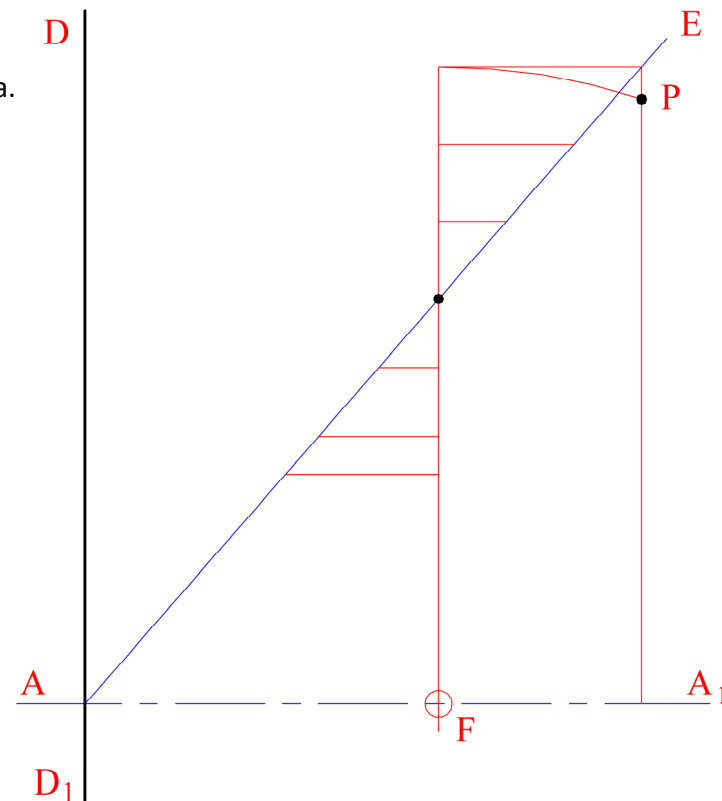
A-3. The image below shows an ammonium ion which has the shape of a regular tetrahedron. A Nitrogen atom is located at the centre of the tetrahedron and four Hydrogen atoms are located at the vertices. The drawing shows the projections of a regular tetrahedron $ABCD$ and its centre N .

- (a) Determine the dihedral angle between the planes ABC and ABD .
- (b) Determine the true angle between the lines BN and CN .



A-2. The image below shows the Spinnaker Tower in Portsmouth. The design includes two hyperbolas. The drawing on the right shows the axis AA_1 , directrix DD_1 , focus F and eccentricity line E of a similar hyperbola. Two points on the curve are given.

- (a) Locate the vertex, five additional points on the curve, and draw the top portion of the hyperbola.
- (b) Draw a tangent to the curve at point P .

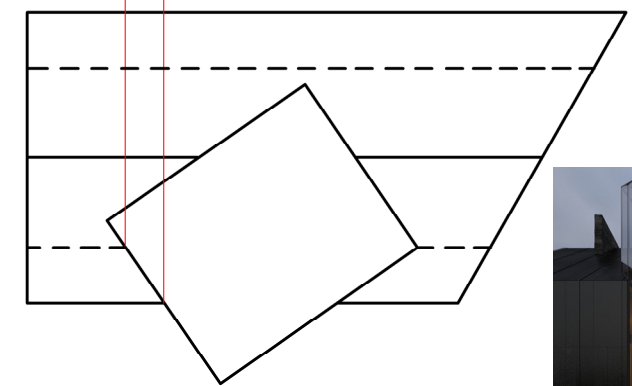
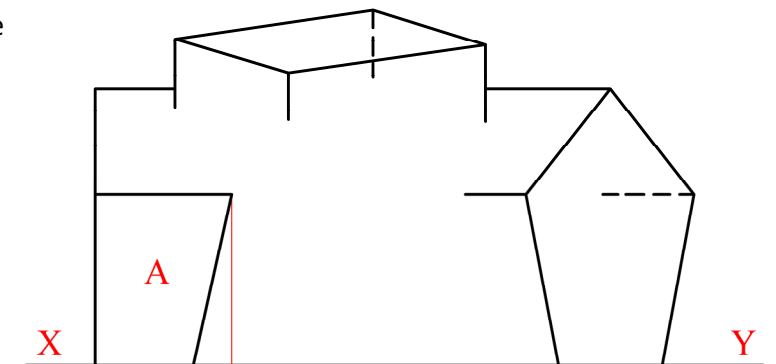
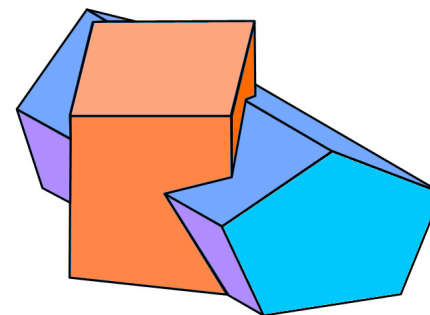


A-4. The image below shows a modern house design which is based on intersecting prisms. The drawing shows the plan and incomplete elevation of a similar structure which includes a pentagonal prism intersected by a truncated rectangular prism.

The drawing shows the plan and incomplete elevation of a similar structure which includes a pentagonal prism intersected by a truncated rectangular prism.

A pictorial view of the intersecting solids is given.

- (a) Complete the elevation, showing all lines of interpenetration.
- (b) Determine the true shape of the surface A .



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)

