



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:

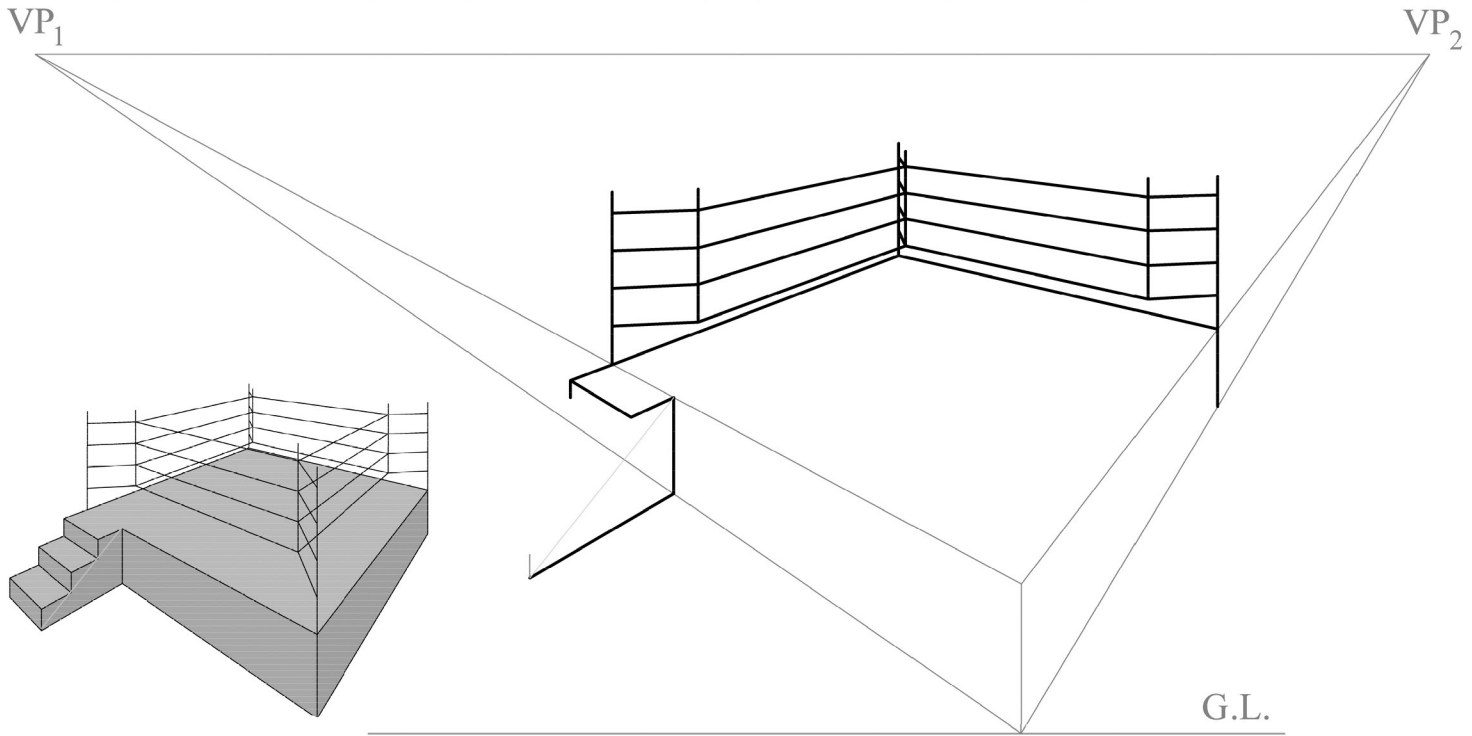
- *Construction lines must be shown on all solutions.*
- *Write the question number distinctly on the answer paper in Sections B and C.*
- *Work on one side of the drawing paper only.*
- *All dimensions are given in metres or millimetres.*
- *Write your Examination number in the box below and on all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

Examination Number

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.

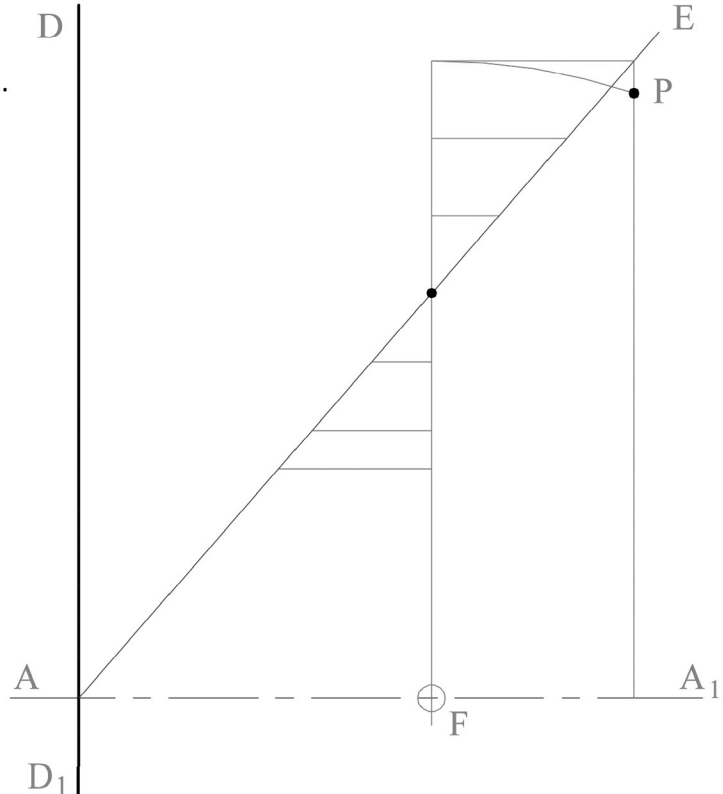
(b) The steps are of equal height. Complete the perspective drawing of the steps.



A-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.

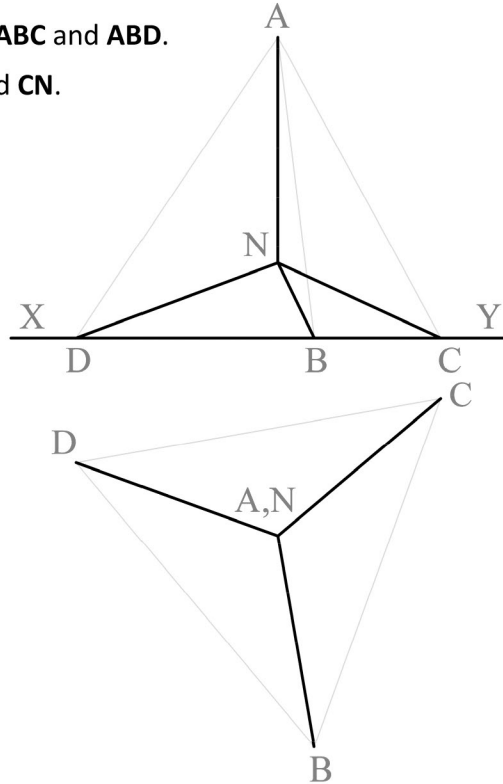
(a) Locate the vertex, five additional points on the curve, and draw the top portion of the hyperbola.

(b) Draw a tangent to the curve at point P .



A-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-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.

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**.

