Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Final Examination 2023

Graphics

Common Level

Tuesday 13 June Morning 9:30 - 11:30

280 marks

Examination Number

Day and Month of Birth

For example, 3rd February is entered as 0302

Centre Stamp

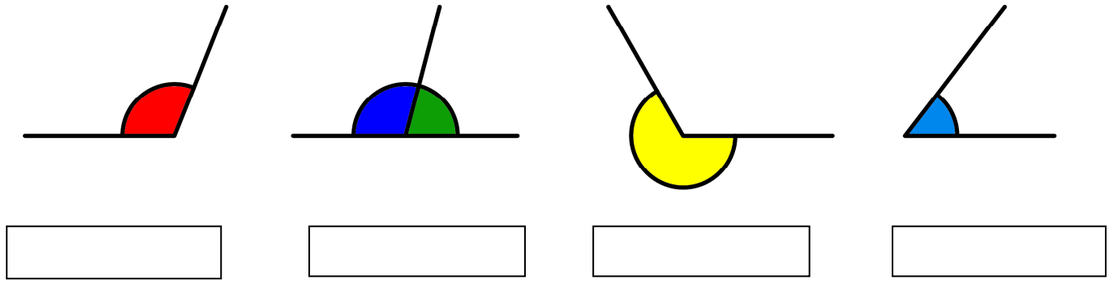
Question	Mark
1	
2	
3	
4	
5	
Paper Total	
Student Project	
Grand Total	
Grade	

General Instructions:

- Answer all questions
- All constructions must be clearly shown
- All measurements are in millimetres
- The graphics presented are not necessarily drawn to scale
- Complete your answers in the spaces provided in this booklet
- When using a T-square, you may mount the back cover of this booklet to your drawing board or desk, using tape
- There is space for extra work at the end of the booklet
  Label any such extra work clearly with the question number and part
- This booklet must be handed up at the end of the examination.

1. **(a)** Using the list below, label **each** angle in the space provided.

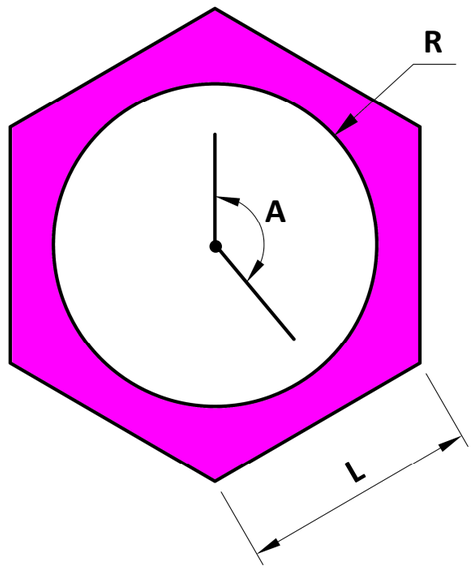
- Acute
- Reflex
- Obtuse
- Supplementary



(b) Shown below is a clock based on a regular polygon.

(i) Name the polygon used in the clock.

(ii) Use your drawing instruments to measure the following:

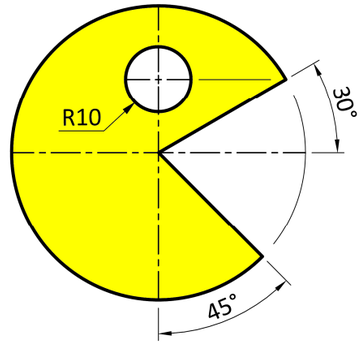


Angle A =

Length L =

Radius R =

(c) The image on the right shows a design for a computer game character based on circles.

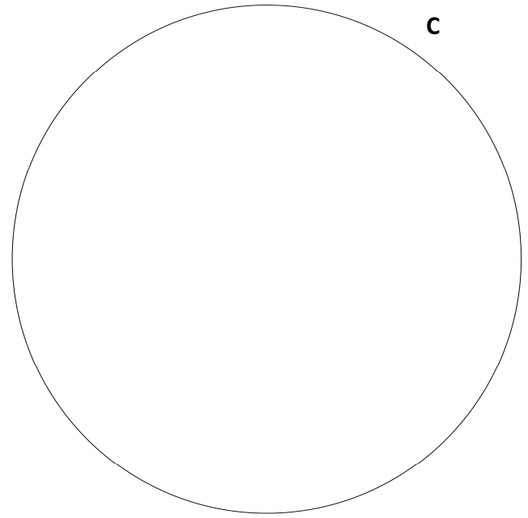


Complete the drawing of the computer game character below by:

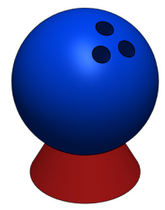
(i) Locating the centre of the circle **C**.

(ii) Completing the drawing as shown in the image on the right.

Show all constructions clearly.

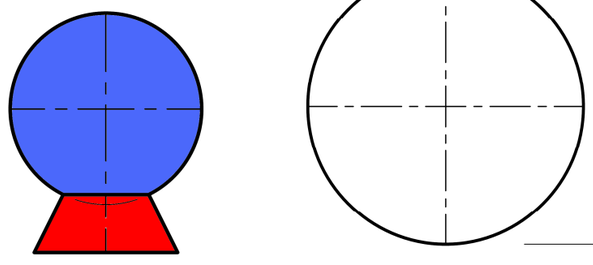


(d) The image across shows a bowling ball sitting on a stand.
Shown on the left below is the elevation of a similar ball on a stand.



Complete the elevation on the right below by drawing the bowling ball sitting on the stand so that the ball is in contact with points **P** and **Q**.

Show all constructions clearly.

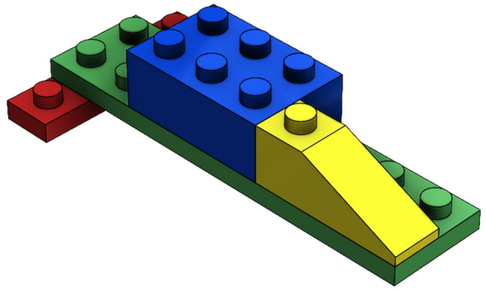


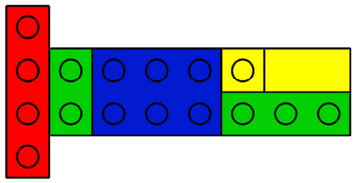
2.

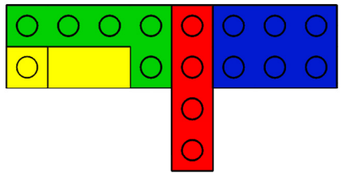
(a) The image across shows an arrangement of Lego blocks.

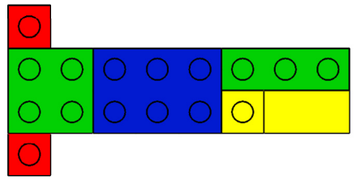
Shown below are similar arrangements of the same Lego blocks.

Using a ✓ indicate which **one** of the arrangements below matches the arrangement across.





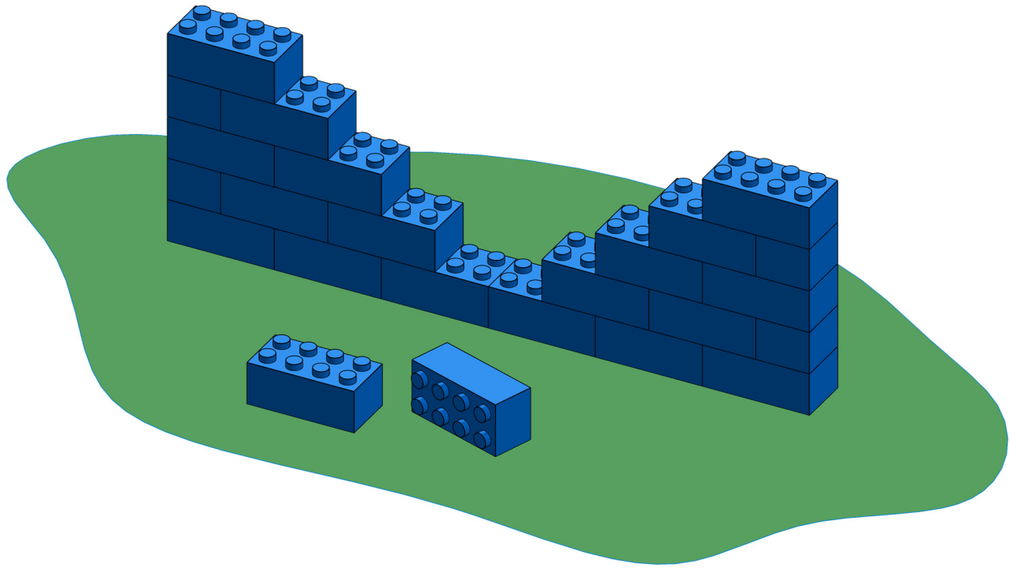




(b) Shown below is an incomplete wall, built from Lego blocks.

How many blocks will it take to complete the wall?

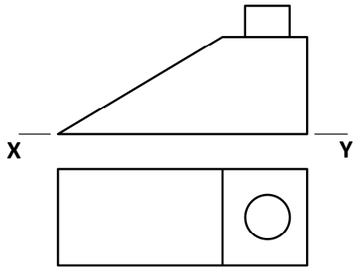
Number of blocks = ☐



(c) The elevation and plan of a Lego block are shown below.

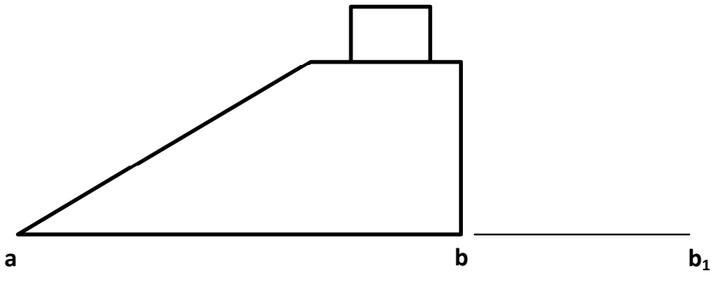
In the space provided, draw a **freehand pictorial sketch** of this Lego block.

Colour **or** shade the sketch.

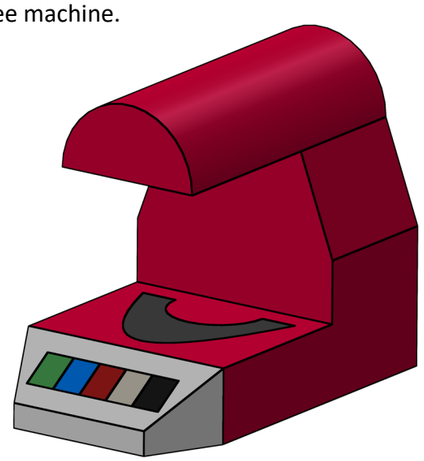


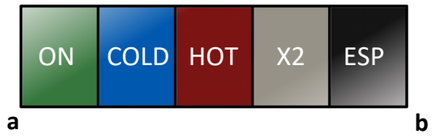
(d) The elevation of the same Lego block is shown below.

Draw a new Lego block similar to the given block, with the length **ab** increased to $\mathbf{ab_1}$.



3. Shown below is a 3D model of a coffee machine. Also shown is an enlarged view of the control panel of the coffee machine.

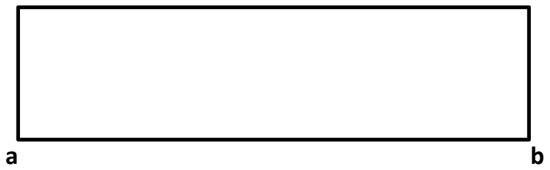




(a) The outline of the control panel is shown below.

Complete the drawing of the control panel by dividing the line **ab** into five equal parts.

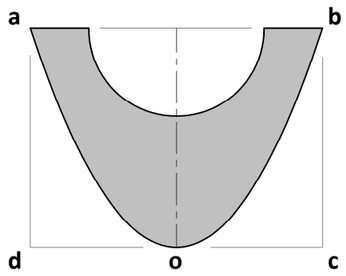
Colour **or** shade the completed drawing.

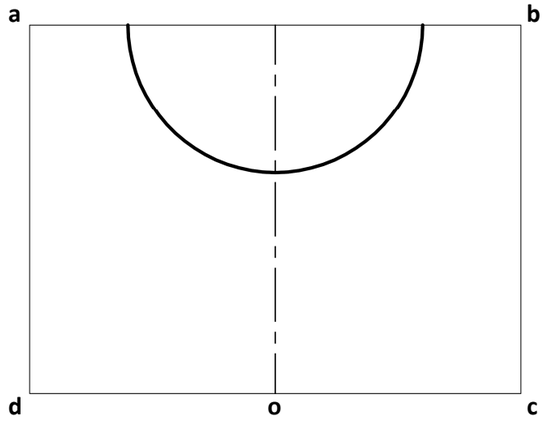


(b) Shown on the left below is the plan of the drip tray.

The design of the drip tray is based on a parabola **aob** with vertex at **o**.

Complete the drawing of the drip tray in the given rectangle **abcd**.

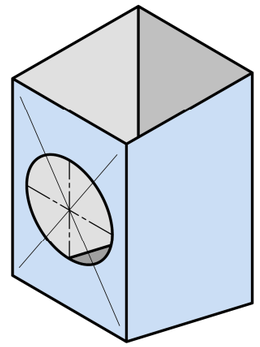


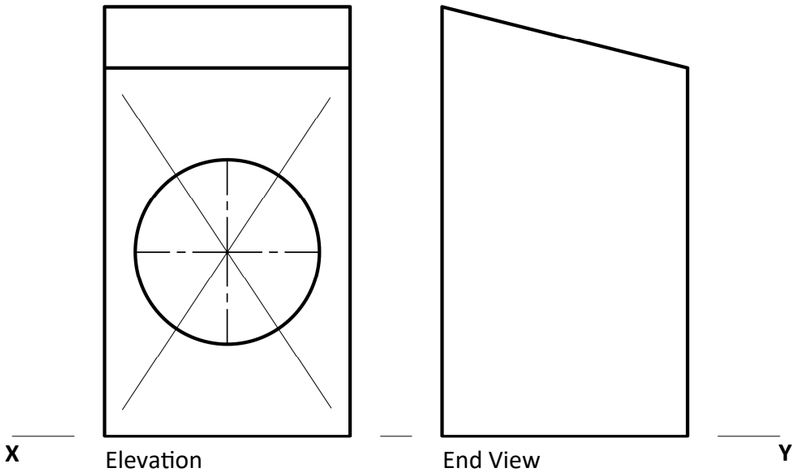


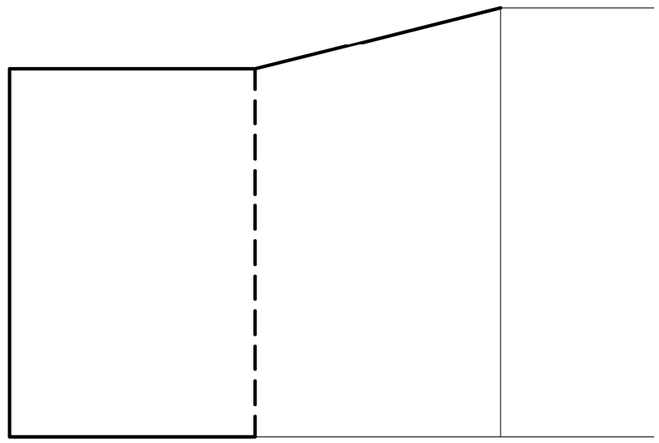
(c) Shown across is a box used to package the pods for the coffee machine.

The elevation, end view, and incomplete surface development of a similar box are shown below. This box is based on a square-based prism and has the lid removed.
A 3D graphic of this box is also shown.

Complete the surface development of the box.







(d) The image shows the design of a similar coffee machine.

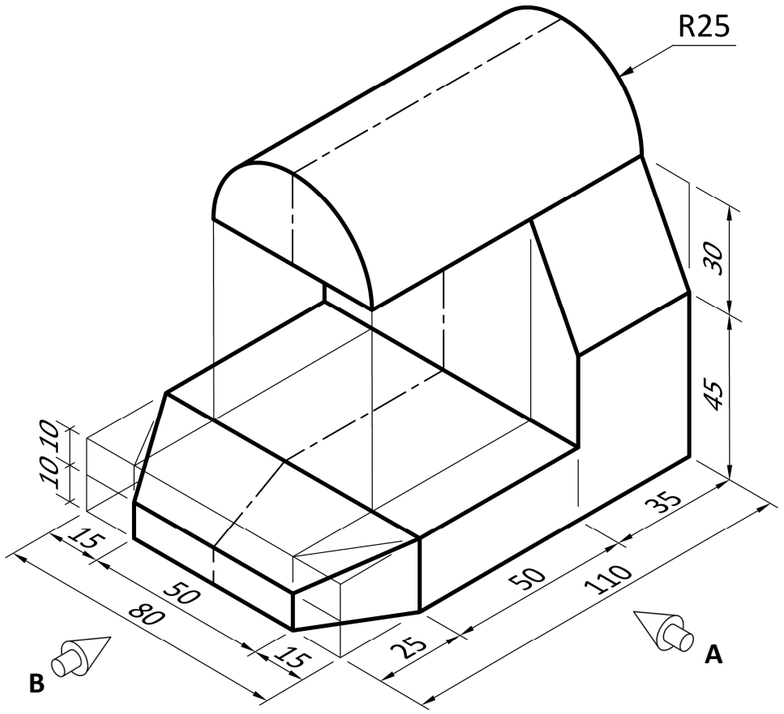
Draw:

(i) An elevation in the direction of arrow **A**.

(ii) A plan projected from the elevation.

(iii) An end view in the direction of arrow **B**.

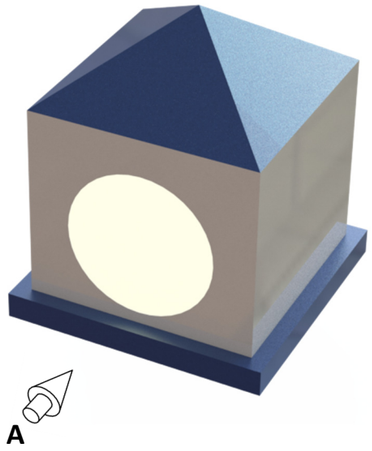
(iv) In elevation, colour **or** shade the surface which is a true shape.



4.

(a) Shown below is a garden lantern.

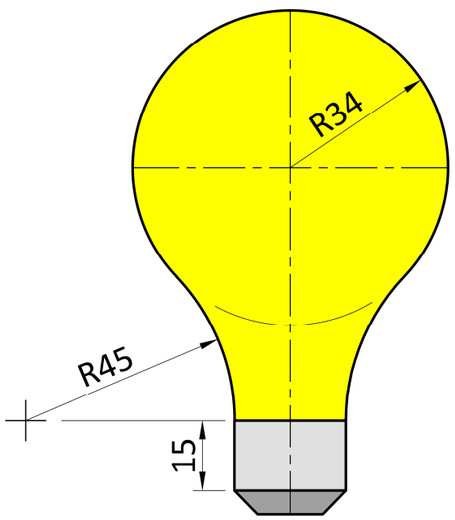
In the space provided, draw a well-proportioned **freehand** sketch of the **elevation** of the lantern looking in the direction of arrow **A**.

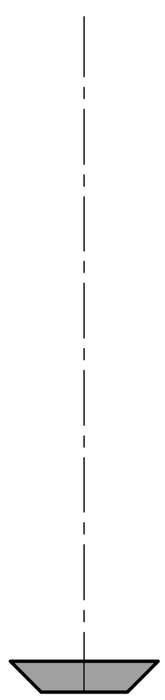


(b) Shown below is an outline drawing of a bulb to be used in the lantern.

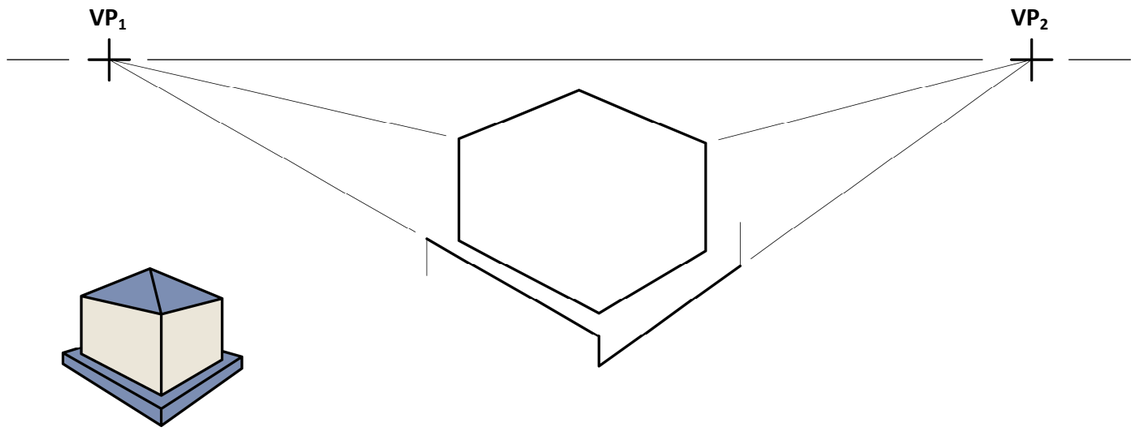
Using the dimensions given, complete the drawing of the bulb on the given centreline.

Show all construction lines and points of contact.

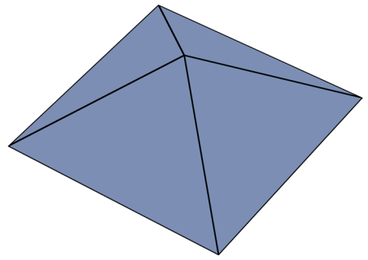




(c) Shown below is the incomplete perspective drawing of the lantern **without** the circular window. A 3D graphic is also shown. Complete the perspective drawing of the lantern.



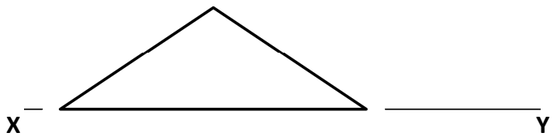
(d) Shown on the right is the roof of the garden lantern. The roof is based on a square-based pyramid.

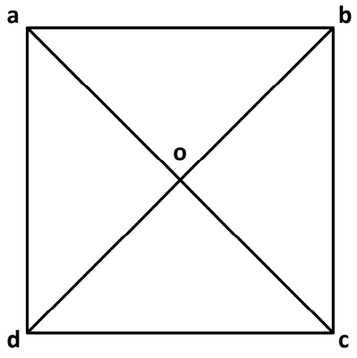


Shown below are the elevation and plan of the roof.

(i) Complete the indexing of the elevation from the given plan.

(ii) Find the true length of the line **oc**.



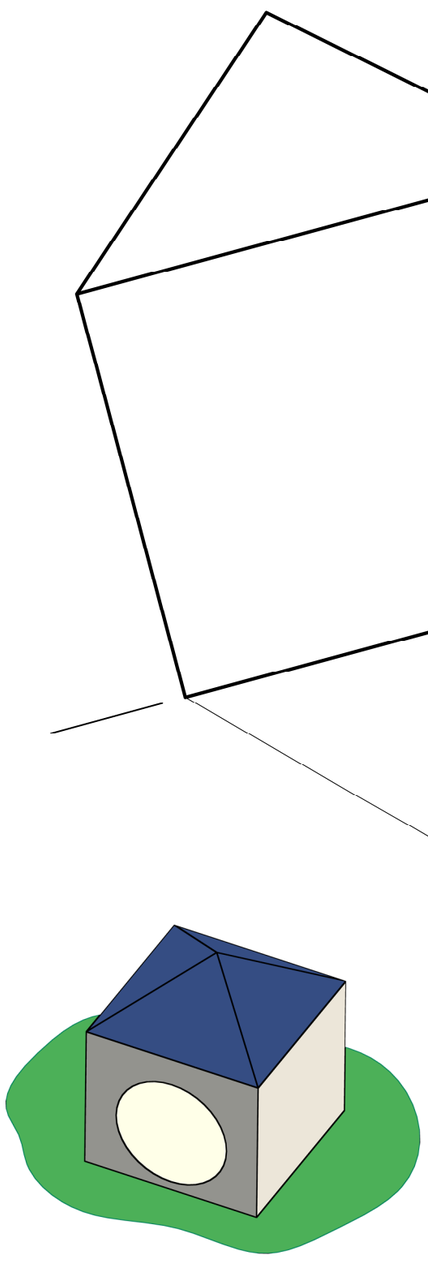


(e) The axonometric axes required for the isometric projection of the garden lantern are shown.

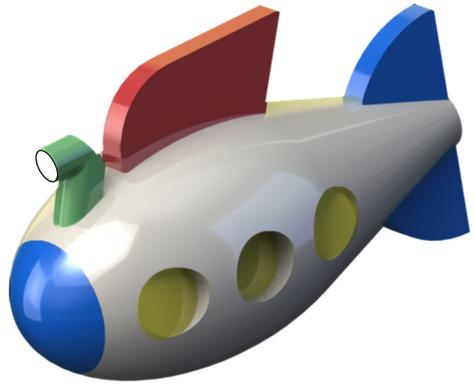
The elevation, end view, and incomplete axonometric projection of the lantern are given.

A 3D graphic of the lantern is also shown.

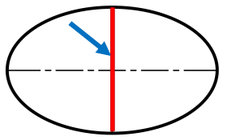
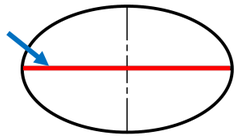
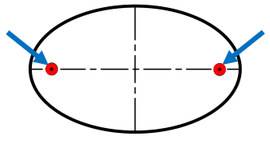
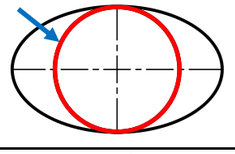
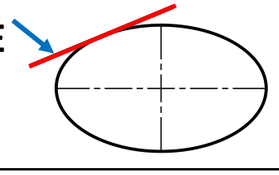
Complete the axonometric projection of the lantern.



5. The image below shows a toy submarine.
The body of the submarine is based on an ellipse.

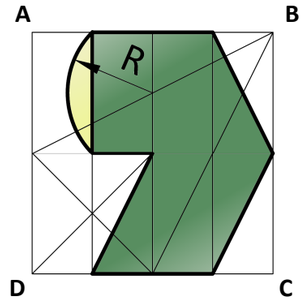


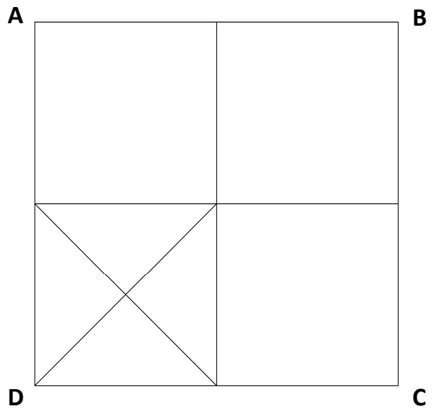
(a) The table below shows a number of parts of the ellipse indicated by arrows.
Complete the table by matching each term with the correct letter.
The first term is completed for you.

A 	TANGENT	E
B 	FOCAL POINTS	
C 	MAJOR AXIS	
D 	MINOR CIRCLE	
E 	MINOR AXIS	

(b) Shown on the right is the outline of the periscope design inscribed in the square **ABCD**.

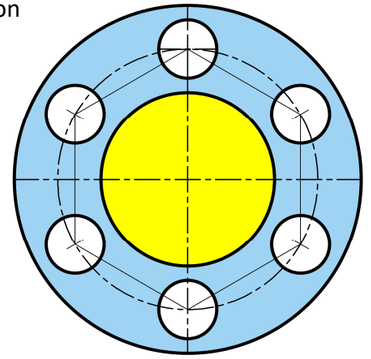
Draw the enlarged design in the square **ABCD** below.

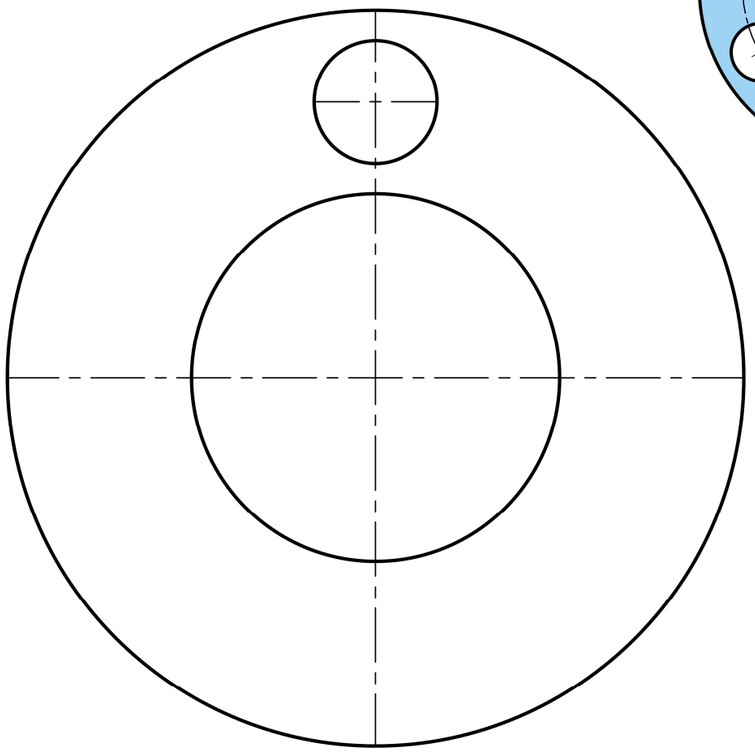




(c) Shown on the right is a design for a porthole window based on circles and a regular hexagon. The incomplete drawing of a similar porthole window is shown below.

Complete the drawing of the porthole window.



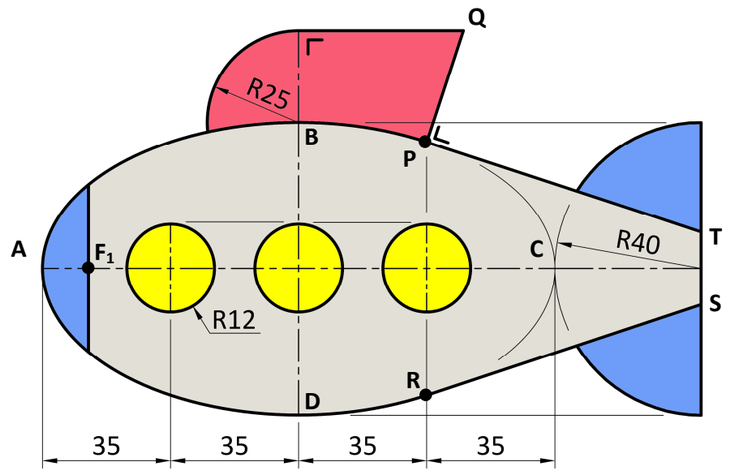


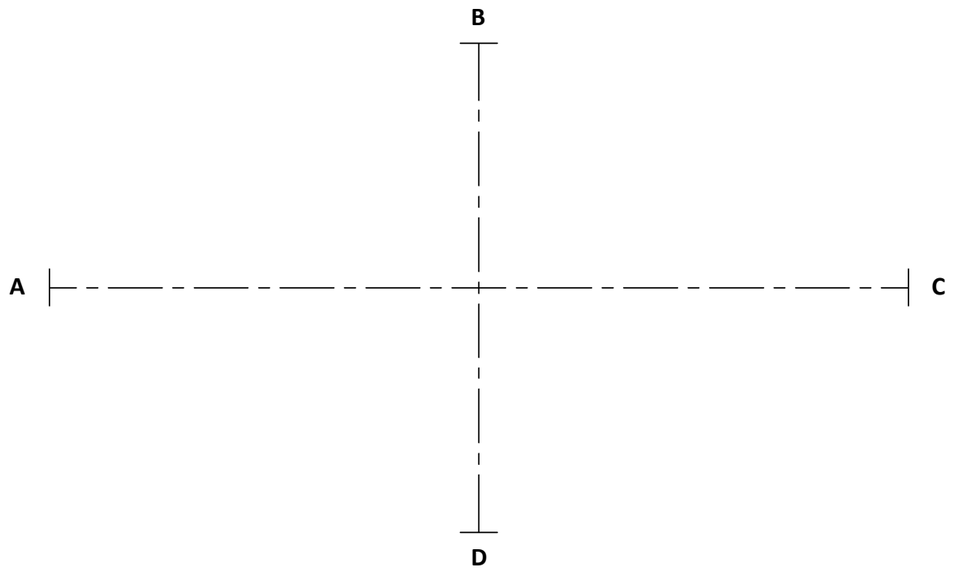
(d) Shown on the right is a dimensioned drawing of the toy submarine.

The curve **ABCD** is an ellipse. **AC** is the major axis and **BD** is the minor axis of the ellipse.
The lines **PT** and **RS** are tangents to the ellipse at points **P** and **R** on the curve.
The line **PQ** is a normal to the tangent **PT**.

(i) Given the lengths of the major axis **AC** and the minor axis **BD** below, draw the ellipse.

(ii) Using the dimensions given, complete the drawing of the submarine.





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Junior Cycle Final Examination – Common Level

Graphics

Tuesday 13 June
Morning 9:30 - 11:30