Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Final Examination 2024

Graphics

Common Level

Tuesday 11 June Morning 9:30 - 11:30

280 marks

Examination Number

Date of Birth / /

For example, 3rd February 2005 is entered as 03 02 05

Centre Stamp

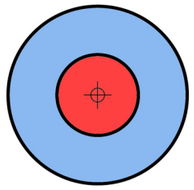
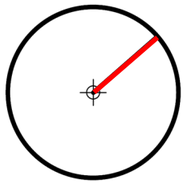
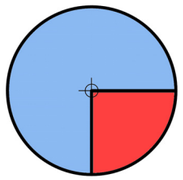
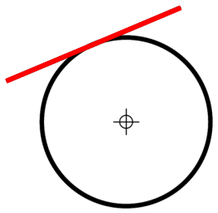
Question	Mark
1	
2	
3	
4	
5	
Paper Total	
Student Project	
Grand Total	
Grade	

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)** The images below show four terms associated with circles.

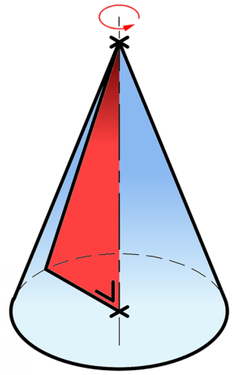
Using a ✓ indicate the correct term for **each** image in the table below.

	**Term:** Concentric ☐ Eccentric ☐
	**Term:** Radius ☐ Diameter ☐
	**Term:** Segment ☐ Quadrant ☐
	**Term:** Tangent ☐ Normal ☐

(b) Using a ✓ indicate whether each of these statements is **true** or **false**.

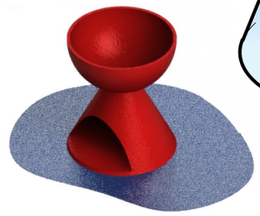
		True	False
(i)	The diameter divides a circle into two equal parts.	☐	☐
(ii)	There are 360^{o} in a full circle.	☐	☐
(iii)	Half of the radius is equal to the diameter.	☐	☐

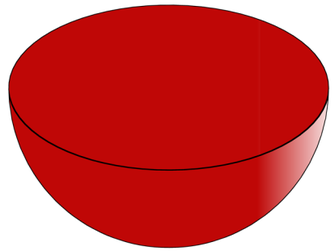
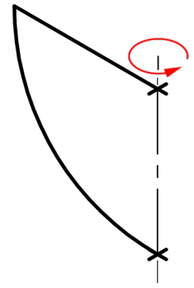
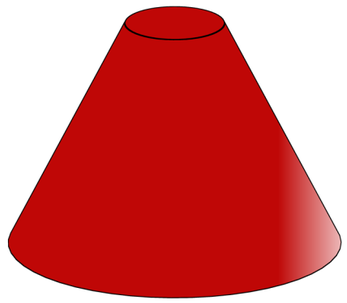
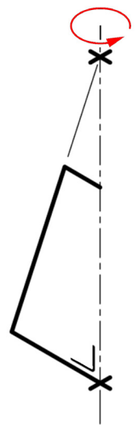
(c) Shown on the right is a cone which has been created by revolving a triangle about an axis. Also shown is a tea light holder based on a hemisphere and a truncated cone.



(i) Complete a freehand sketch of the 3-dimensional object created when each shape below is revolved about its given axis.

(ii) Apply appropriate rendering to each sketch to achieve a 3D effect.



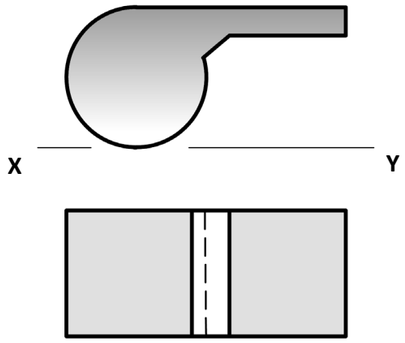
 **Hemisphere**	
 **Truncated Cone**	

2.

(a) The elevation and plan of a whistle are shown below.

In the space provided, draw a **freehand pictorial sketch** of the whistle.

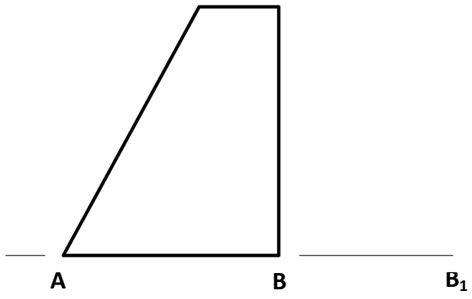
Colour **or** shade the sketch.



(b) The image shows a set of goals.

Shown below is an outline end view of the goals.

Draw a new set of goals similar to the given set with length **AB** increased to $\mathbf{AB_1}$.

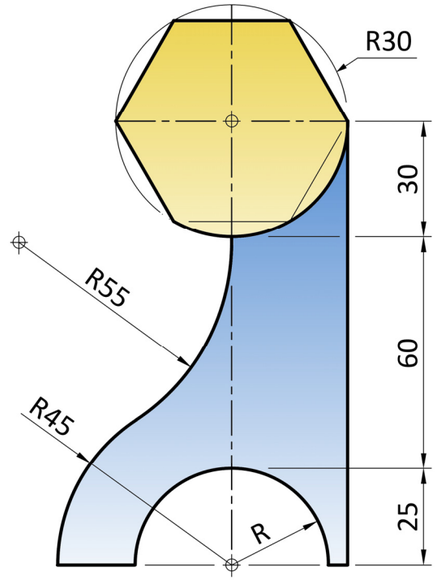


(c) Shown across is an elevation of a sports trophy.
The trophy includes a regular polygon.

(i) Name the polygon.

(ii) Using the dimensions given, redraw the trophy on the centreline and baseline below.

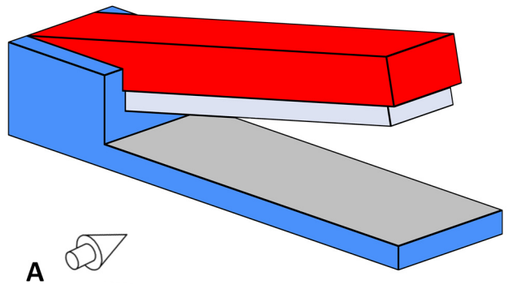
Show all constructions and points of contact.



3. A company sells a range of office supplies and equipment.

(a) Shown below is a stapler.

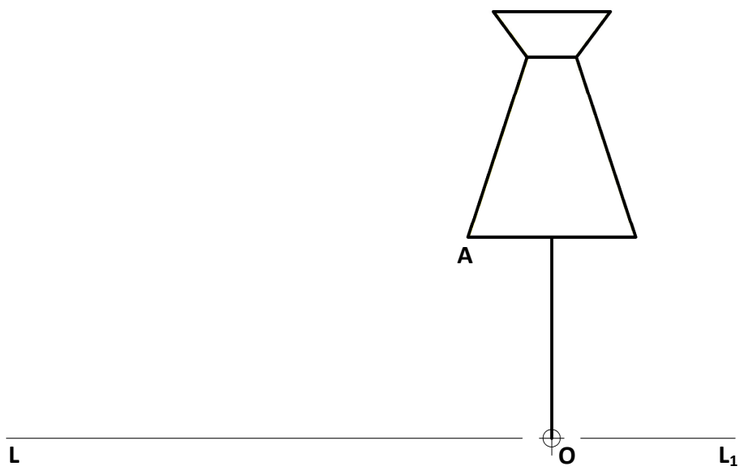
In the space provided, draw a well proportioned **freehand** sketch of the **elevation** of the stapler looking in the direction of arrow **A**.



(b) The image shows a push pin supplied by the company.

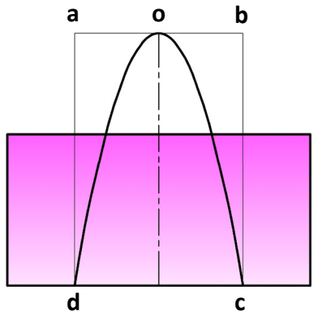
Shown below is an outline drawing of a similar push pin.

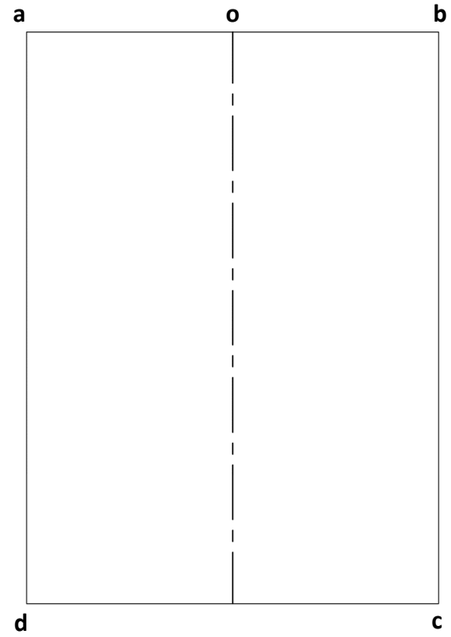
Redraw the push pin below, rotated anti-clockwise about point **O** until point **A** reaches the line $\mathbf{LL_1}$.



(c) The images below show a design for a binder clip.
The clip includes a parabola **doc** with vertex at **o**.

Draw the parabola **doc** in the rectangle **abcd** across.





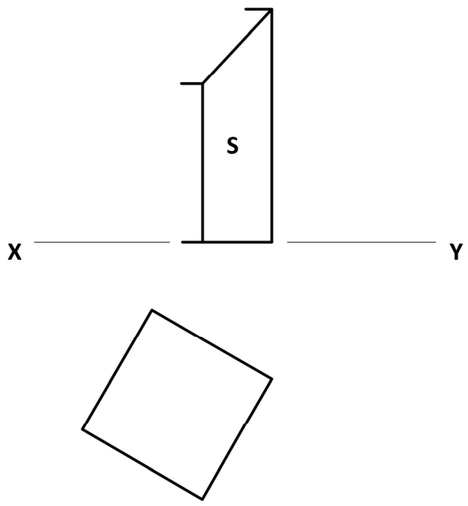
(d) The image across shows a pen holder.
Shown below is the plan and incomplete elevation of a similar pen holder.

(i) Fill in the missing word in the sentence below.

The pen holder is a truncated square-based _____.

(ii) Complete the elevation of the pen holder from the given plan.

(iii) Find the true shape of the surface **S**.



(e) The image below shows the design of an office printer.

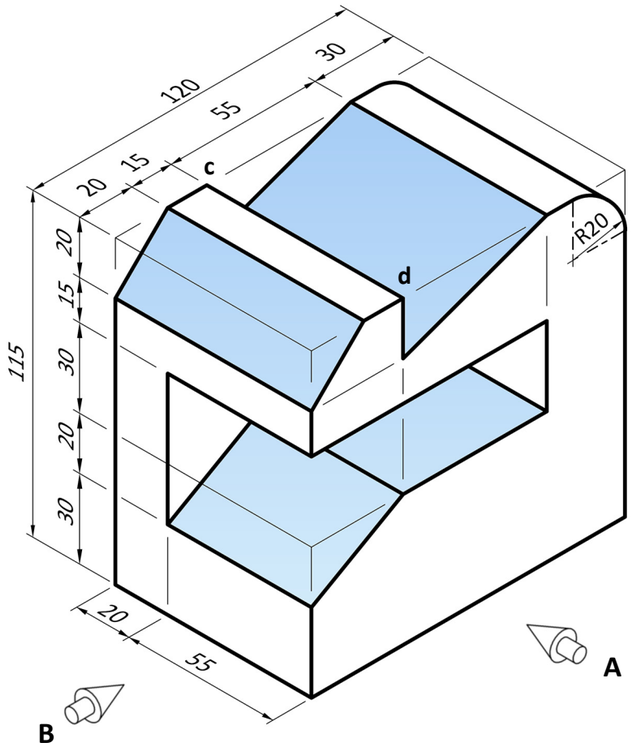
Draw:

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

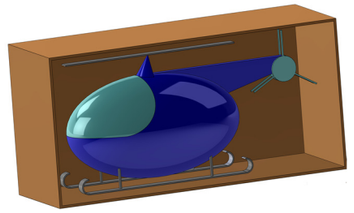
(ii) A plan projected from the elevation.

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

(iv) Index the points **c** and **d** in plan, elevation, and end view.



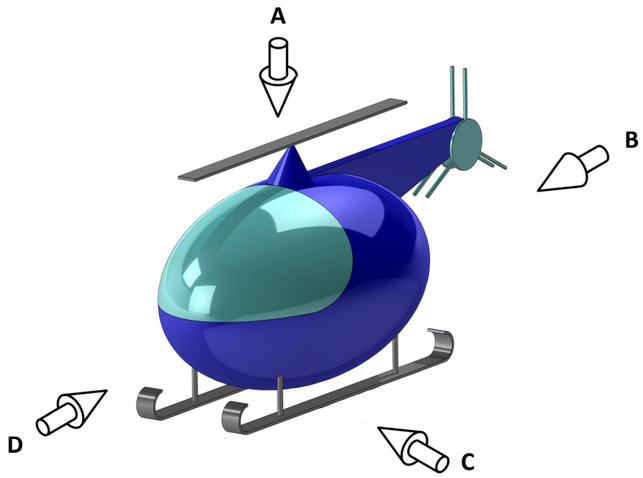
4. The image across shows a toy helicopter packaged for display.
The body of the helicopter is based on an ellipse.

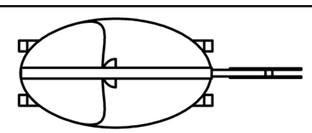
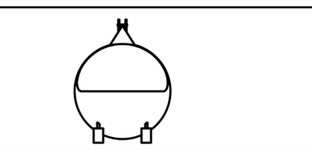
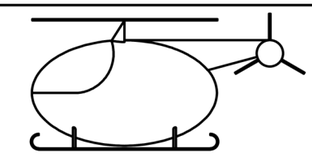
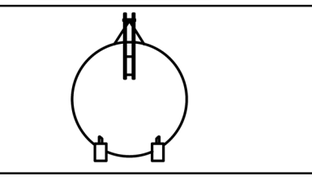


(a) The image below shows a pictorial view of the helicopter.

Match the correct letter with the appropriate orthographic view shown in the table.

One view has been completed for you.

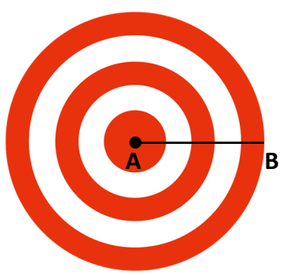


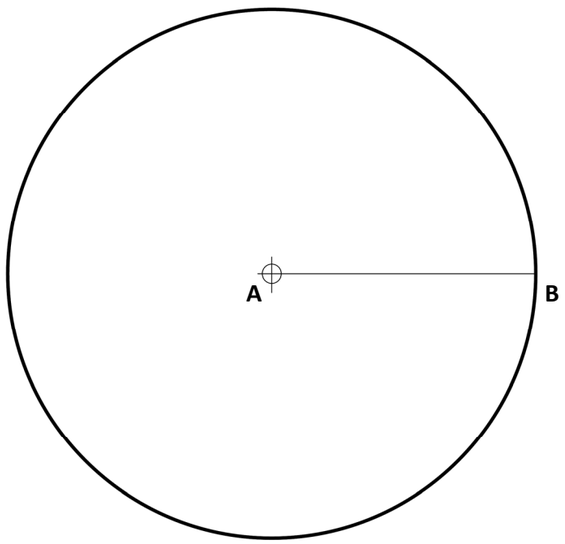
	
	
	
	**B**

(b) Shown below is a design for a helicopter landing pad.
The outline of a similar pad is also shown.

Divide the line **AB** into **5** equal parts and complete the drawing of the landing pad.

Show all constructions clearly.

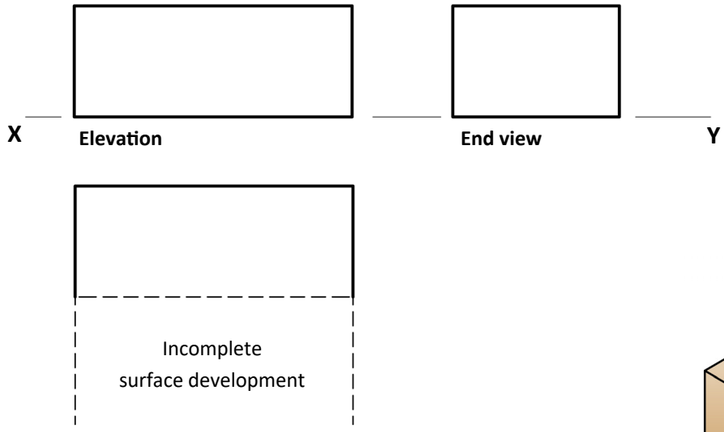


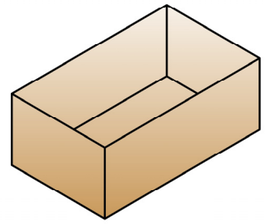


(c) The 3D image on the right below shows the packaging for the toy helicopter.

Shown below is the elevation, end view, and incomplete surface development of the packaging.

Complete the surface development of the packaging.



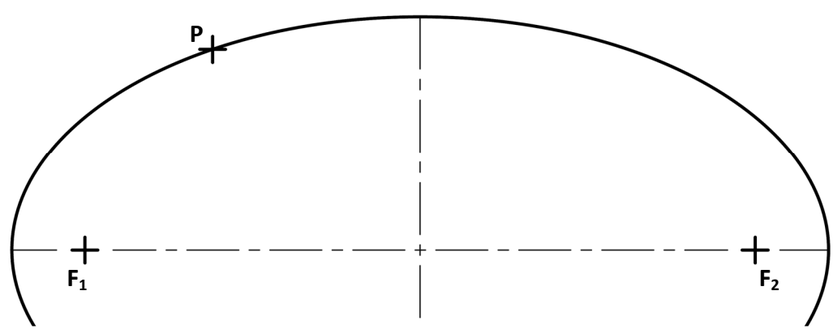


(d) **(i)** Using a ✓ indicate the correct answer to complete the following statement.

The sum of the Focal Radii $|\mathbf{PF_1}| + |\mathbf{PF_2}|$ is equal to:

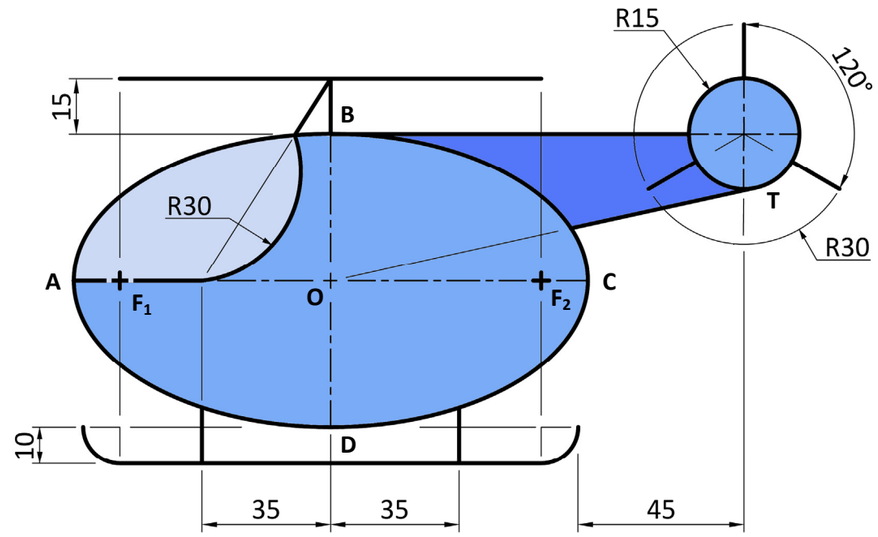
- ☐ Half the major axis
- ☐ Half the minor axis
- ☐ The major axis

(ii) Construct a tangent to the ellipse at point **P**.



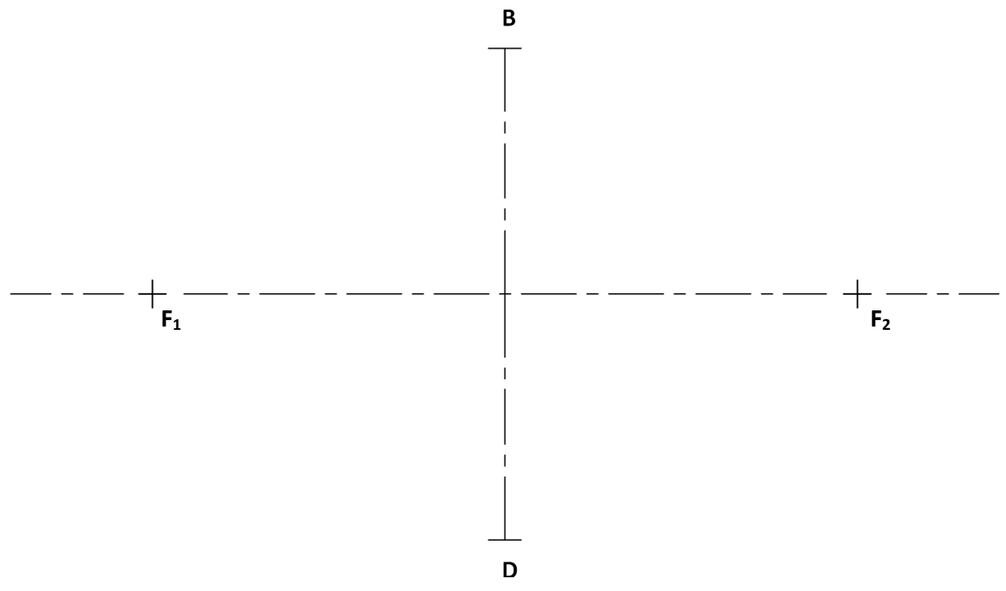
(e) Shown on the right is a dimensioned drawing of the toy helicopter.

The curve **ABCD** is an ellipse. **BD** is the minor axis and $\mathbf{F_1}$ and $\mathbf{F_2}$ are the focal points of the ellipse.
OT is a tangent to the circle.

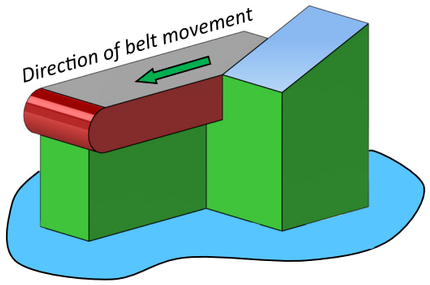


(i) The length of the minor axis **BD**, the focal points $\mathbf{F_1}$ and $\mathbf{F_2}$ and the position of the major axis are given below. Find the length of the major axis and draw the ellipse.

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

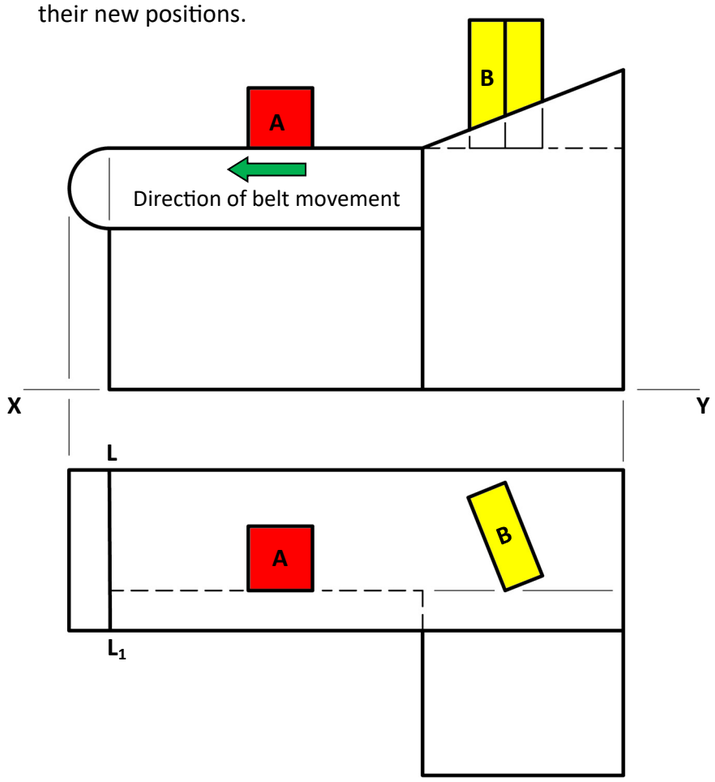


5. **(a)** The image across shows a supermarket checkout.



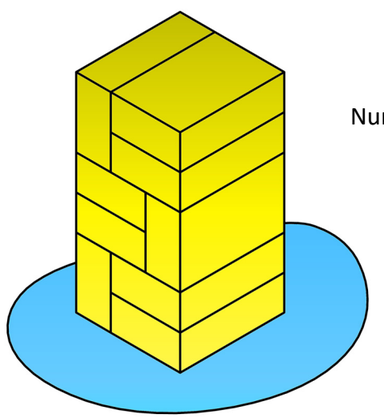
Shown below is the elevation and plan of the checkout.
Two boxes **A** and **B** are on the belt of the checkout.
Boxes **A** and **B** move with the belt until box **A** reaches the line **L-L$_1$** in plan.

Complete the given plan and elevation to show **both** boxes in their new positions.



(b) Shown below are cereal boxes on display in a supermarket.

In the space provided, write down the number of boxes in the display.

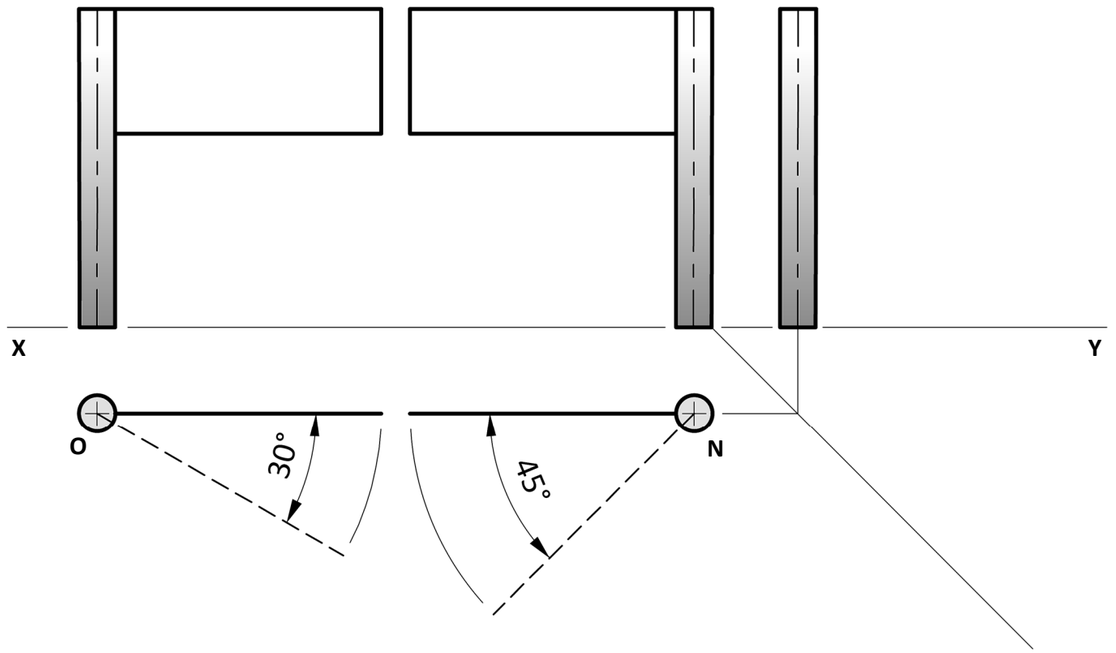


Number of boxes:_____

(c) The elevation, plan, and incomplete end view of a supermarket entrance barrier are given below.

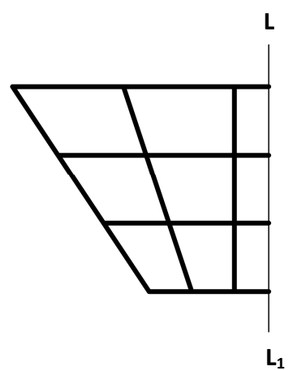
The gates of the barrier open separately. One rotates through 30° about point **O** and the other through 45° about point **N** as shown by the broken lines in plan.

Complete the end view of the entrance barrier to show both gates in their rotated positions.

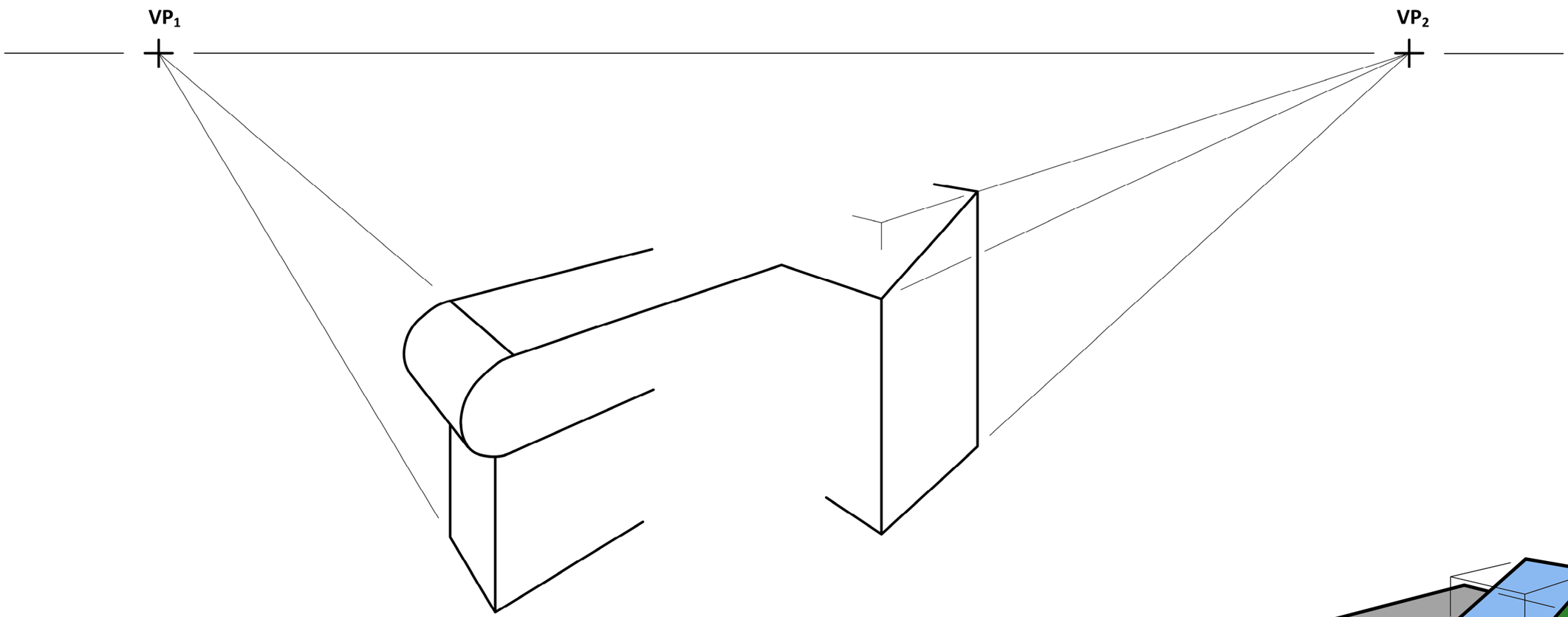


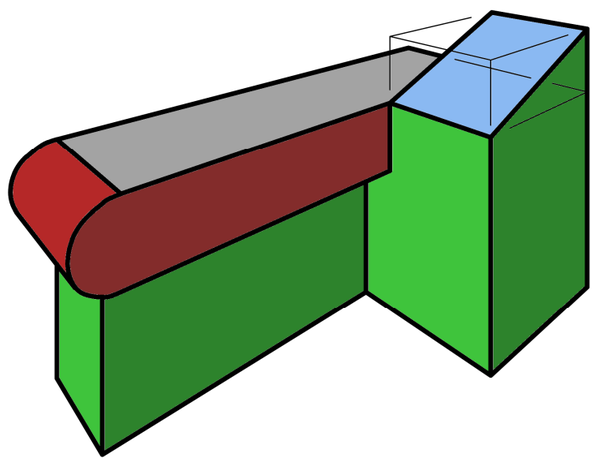
(d) Shown below is an incomplete logo for a self-service checkout.

Complete the logo by constructing an axial symmetry in the line **L-L$_1$**.



(e) Shown below is an incomplete perspective drawing of the supermarket checkout.
A 3D graphic is also shown. Complete the perspective drawing of the checkout.





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Junior Cycle Final Examination – Common Level

Graphics

Tuesday 11 June
Morning 9:30 - 11:30