Coimisiún na Scrúduithe Stáit
State Examinations Commission

Junior Cycle Final Examination

Sample Paper

Graphics

Common Level

2 Hours

280 marks

Examination Number

Centre Number

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
Paper Total	
Student Project	
Grand Total	
Grade	

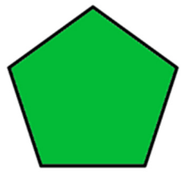
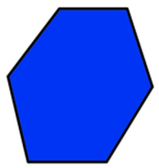
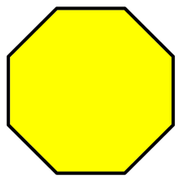
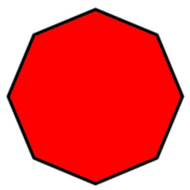
General Instructions:

- 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
- 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 table below shows a number of polygons. In the spaces provided:

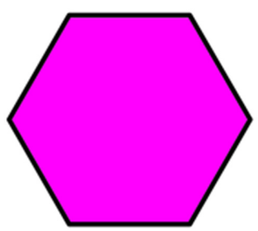
(i) Name each of the polygons.

(ii) Using a ✓ indicate whether each polygon is **regular** or **irregular**.

	**Name:** _____ **Regular polygon** ☐ **Irregular polygon** ☐
	**Name:** _____ **Regular polygon** ☐ **Irregular polygon** ☐
	**Name:** _____ **Regular polygon** ☐ **Irregular polygon** ☐
	**Name:** _____ **Regular polygon** ☐ **Irregular polygon** ☐

(b) Shown below on the right is a regular hexagon.
Using a ✓ indicate whether each of the following statements is **true** or **false**.

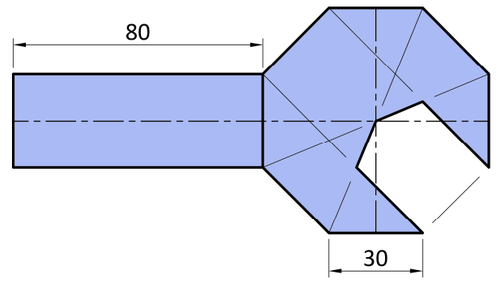
		True	**False**
(i)	A regular hexagon has six equal sides.	☐	☐
(ii)	A regular hexagon cannot be inscribed in a circle.	☐	☐
(iii)	The exterior angle of a hexagon is equal to 60^{o}.	☐	☐

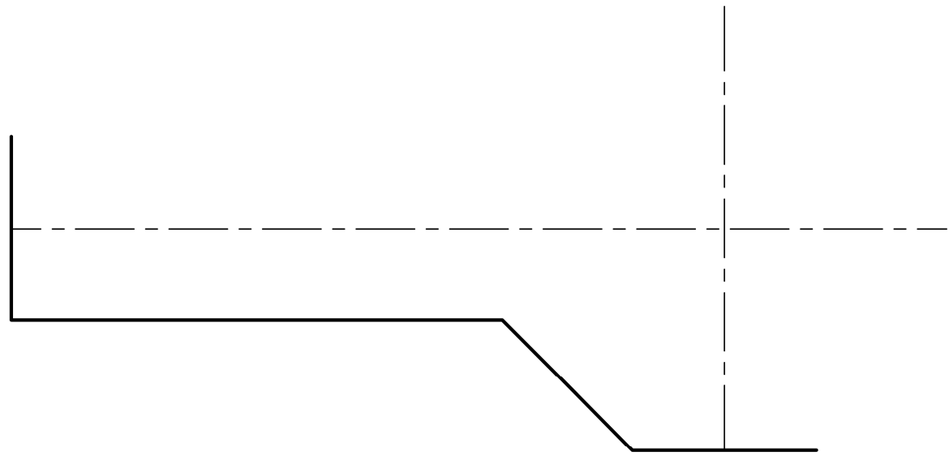


(c) Shown below is the logo for a car repair service. The logo is based on a regular octagon. Also shown is an incomplete drawing of a similar logo.

(i) Complete the drawing of the logo.

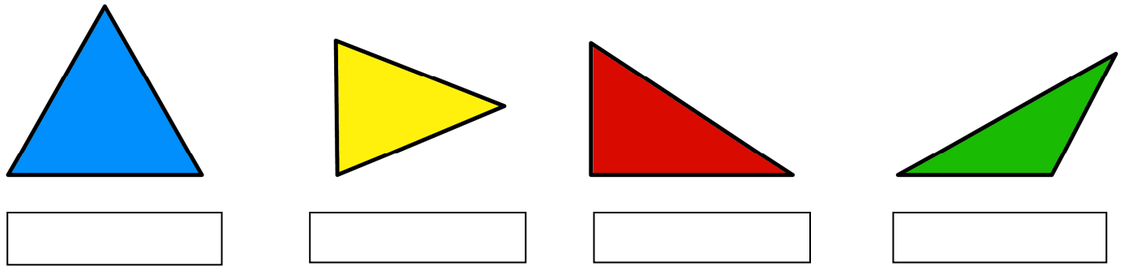
(ii) Colour **or** shade the completed drawing.





2. **(a)** Using the list given below, label each triangle in the space provided.

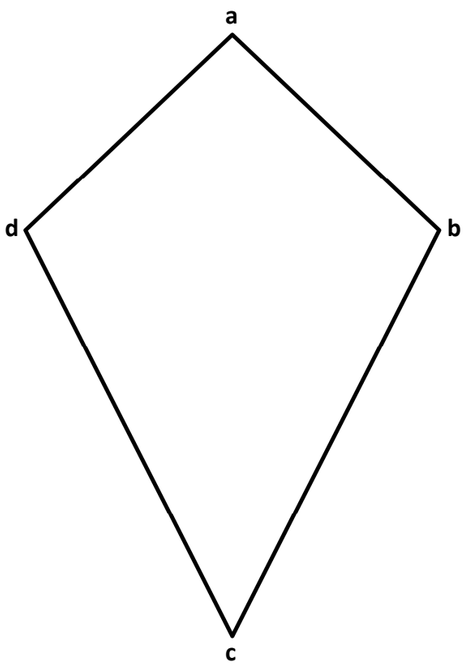
- Scalene
- Right angled
- Equilateral
- Isosceles

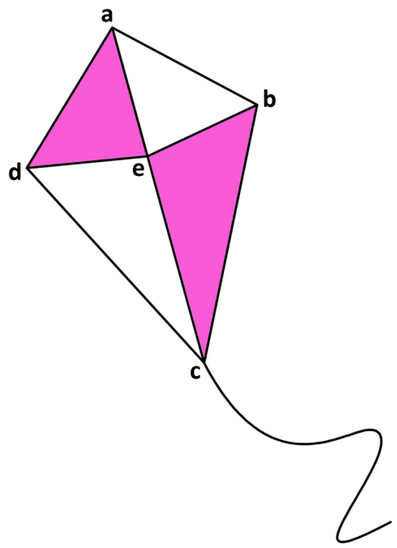


(b) The image across shows a design for a kite **abcd** based on triangles.
The lines **be** and **de** bisect the angles **abc** and **cda** respectively.

Shown below is an incomplete drawing of a similar kite.
Complete the drawing of the kite below by finding point **e**.
Show all constructions clearly.

Colour **or** shade the completed drawing.



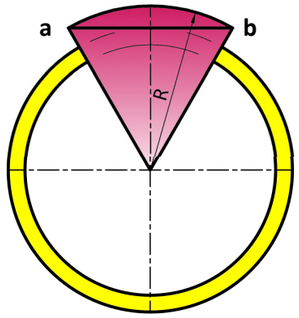


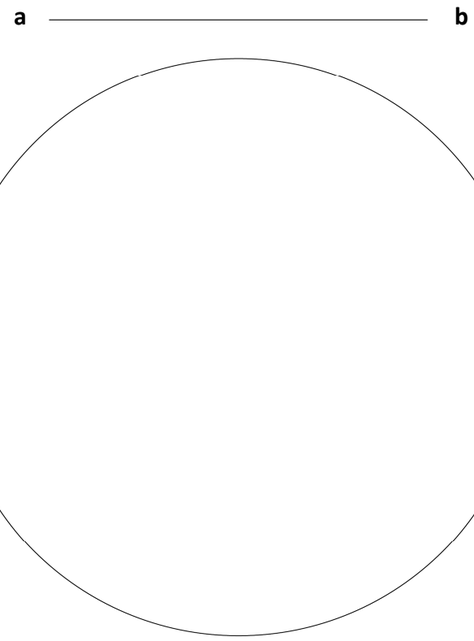
(c) The image shows a jewellery shop logo based on an equilateral triangle.
Complete the drawing of the jewellery shop logo below by:

(i) Locating the centre of the circle.

(ii) Complete the logo as shown in the image on the right.

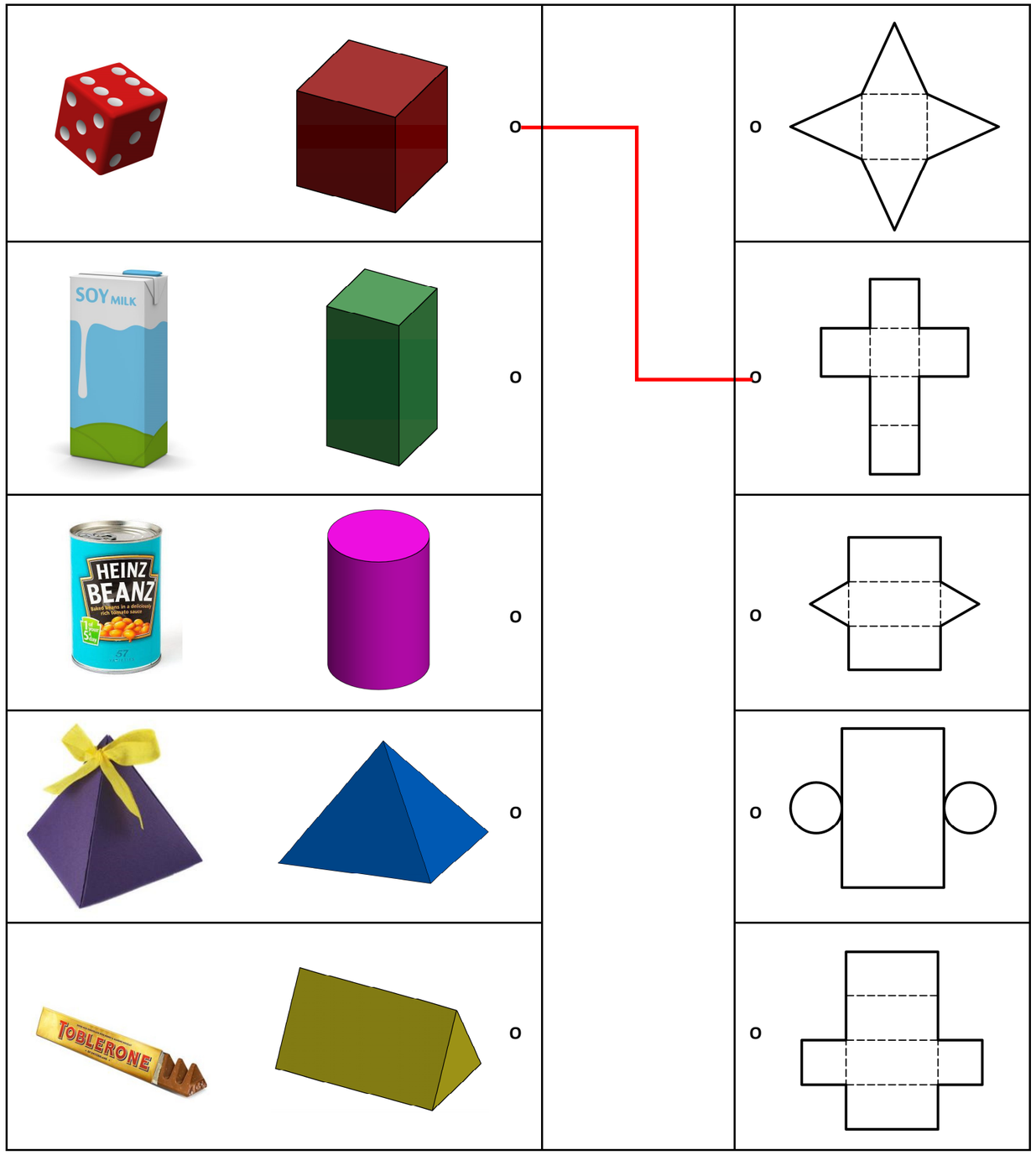
Show all constructions clearly.





3. **(a)** Shown below on the left are a number of objects. The design of each of these objects is based on a geometric solid. These geometric solids are also shown.

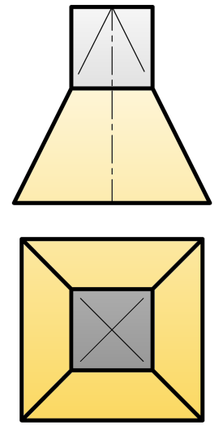
Match each of the geometric solids shown below on the left with its correct development on the right. The first one is completed for you.



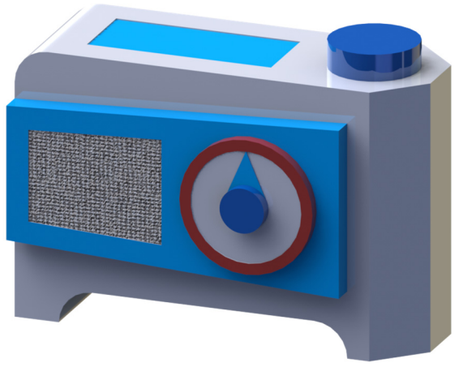
(b) Shown is the plan and elevation of a design for a perfume bottle. The design is based on a square-based pyramid and a cube.

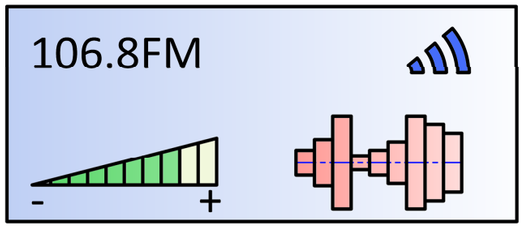
In the space below, draw a freehand pictorial sketch of the perfume bottle.

Colour **or** shade the completed sketch.

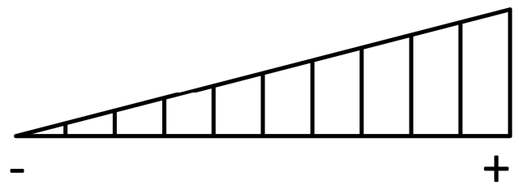


4. Shown below is a 3D model of a retro style radio.
Also shown is a drawing of the LCD panel on the top surface of the radio which displays the frequency, volume level, WiFi connection and a graphic equaliser display.

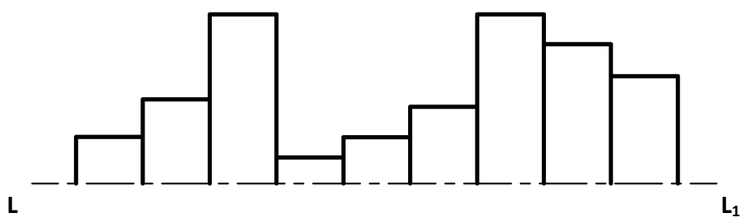




(a) The outline drawing of the volume level display is shown below.
Shade the display to show the volume level set to **60%**.

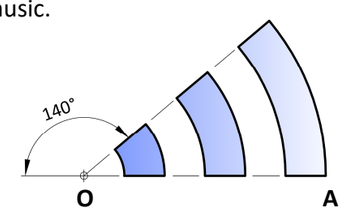


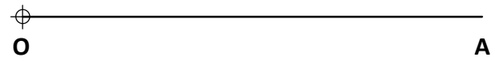
(b) An incomplete drawing of the graphic equaliser display is shown below.
Complete the drawing by constructing an axial symmetry in the line **LL_1**.



(c) The radio has WiFi connectivity for downloading and streaming music.
The drawing across shows a logo for a wireless connection.

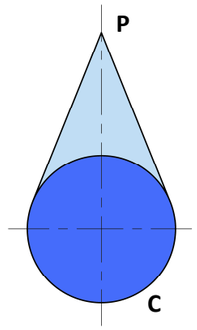
Divide the line **OA** into **6** equal parts and complete the drawing of the wireless logo below.

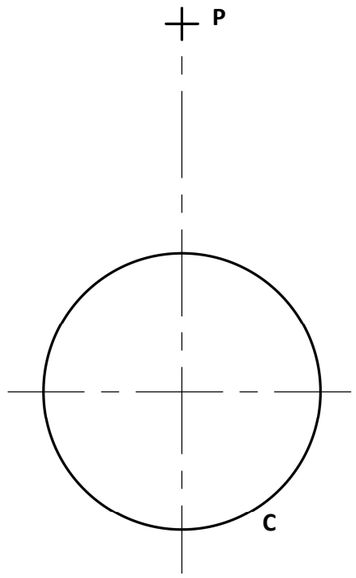




(d) The radio has a manual tuning dial.
An outline drawing of the tuning dial is shown across.

Complete the drawing of the tuning dial below by constructing tangents from point **P** to the circle **C**.





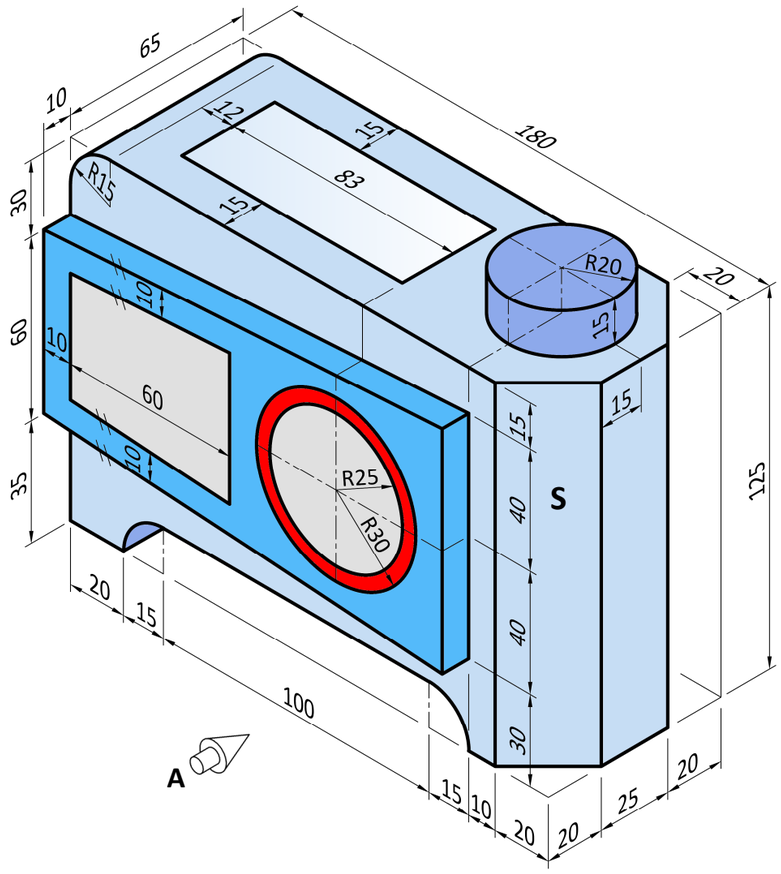
4. **(e)** The image below shows the design of a similar radio.

Draw:

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

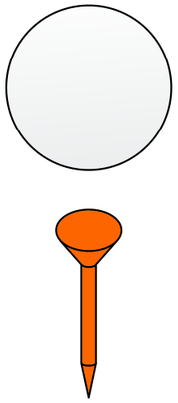
(ii) A plan projected from the elevation.

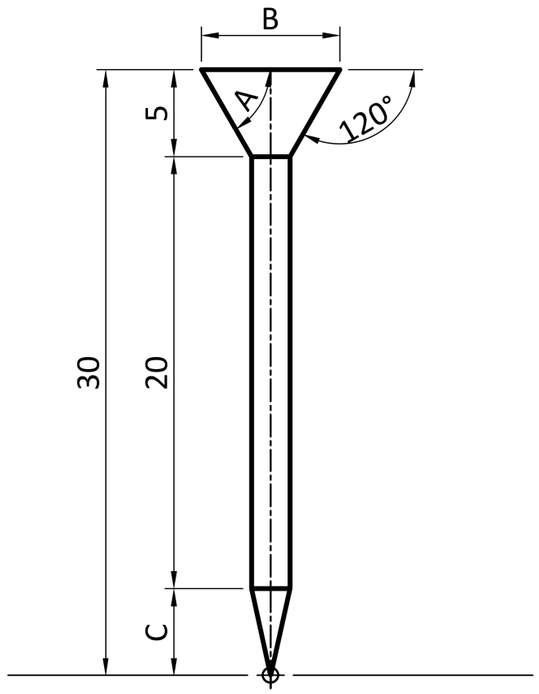
(iii) Determine the true shape of surface **S**.

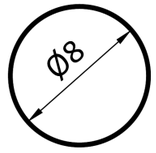


5. **(a)** An image of a golf ball and tee is shown across.
An elevation and plan of a golf tee is shown below.

Write the measurements of **A**, **B** and **C** in spaces provided below.





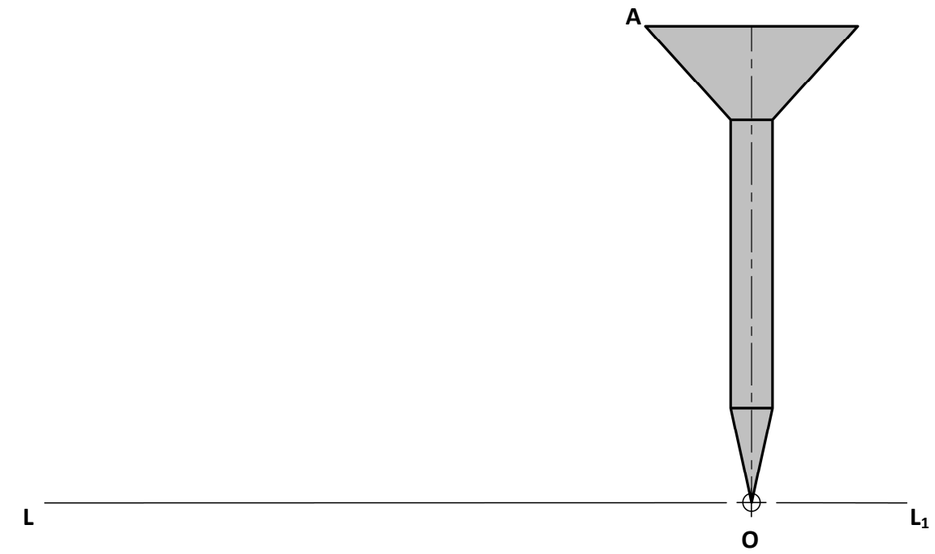


A = ____

B = ____

C = ____

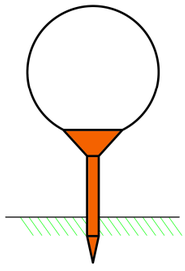
(b) Shown below is the elevation of a similar golf tee.
Rotate the golf tee about point **O** until point **A** reaches the line **LL_1**.

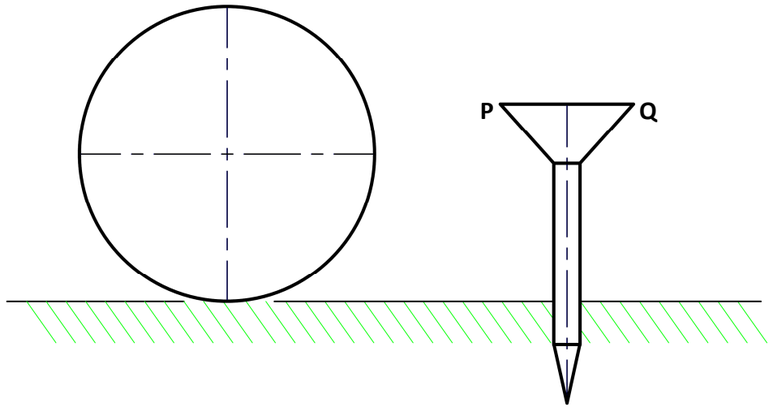


(c) The image across shows a golf ball sitting on a tee.
Shown below is the elevation of a similar golf ball and tee.

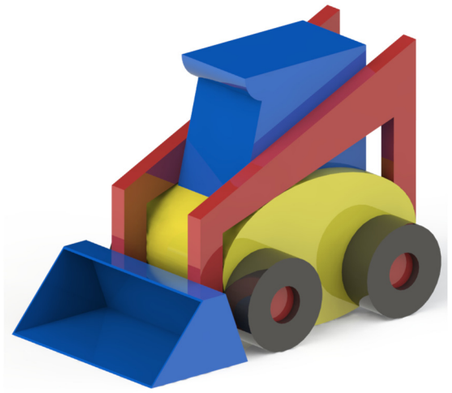
Complete the elevation below by drawing the golf ball sitting on the golf tee so that the golf ball is in contact with points **P** and **Q**.

Show all constructions clearly.





6. The image below shows a design for a toy skid steer loader.
The design of the body of the skid steer is based on an ellipse.

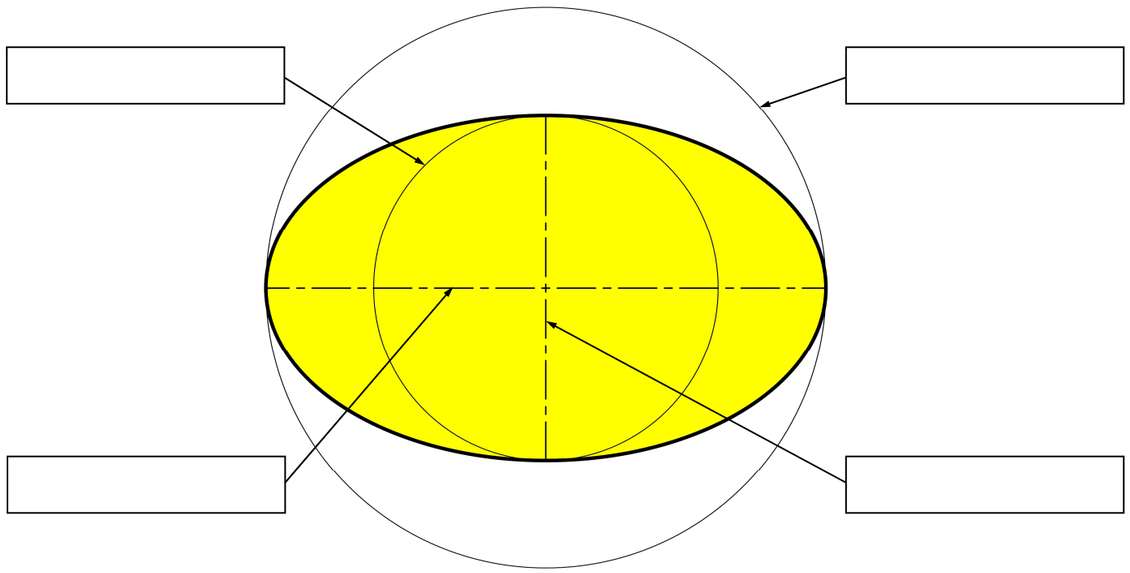


(a) On the drawing below:

(i) Label the parts of the ellipse by selecting from the given list.

- Major axis
- Major circle
- Minor axis
- Minor circle

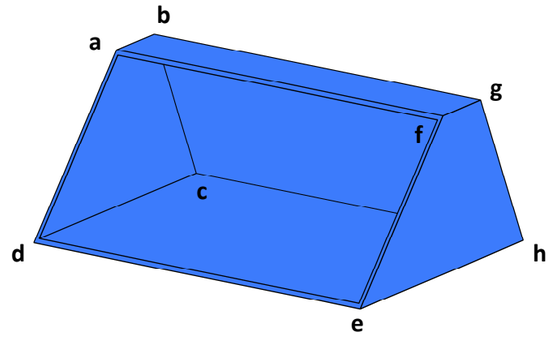
(ii) Locate the focal points of the ellipse.

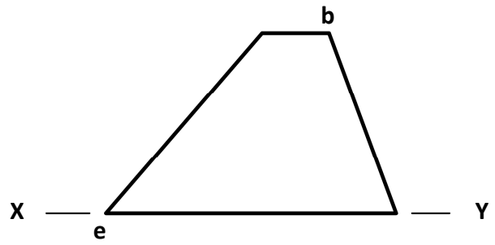


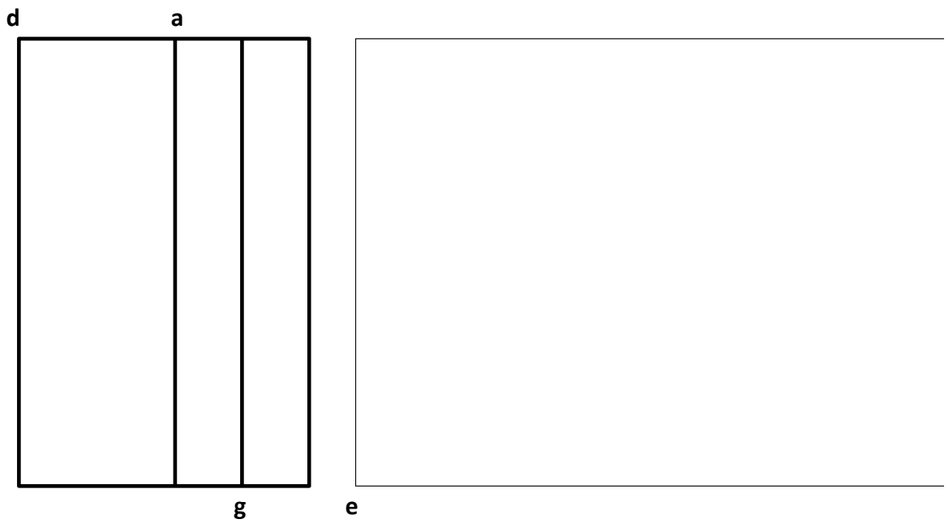
(b) The image below shows the bucket of the skid steer.
The elevation, plan and incomplete development of the bucket are also shown below.

(i) Complete the surface development of the bucket.

(ii) Complete the indexing of the elevation, plan and development of the bucket.





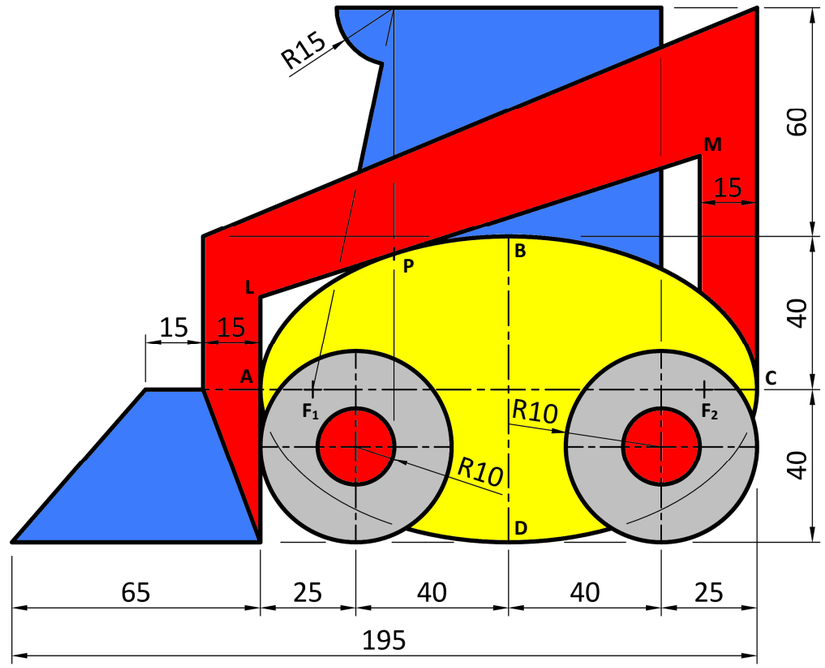


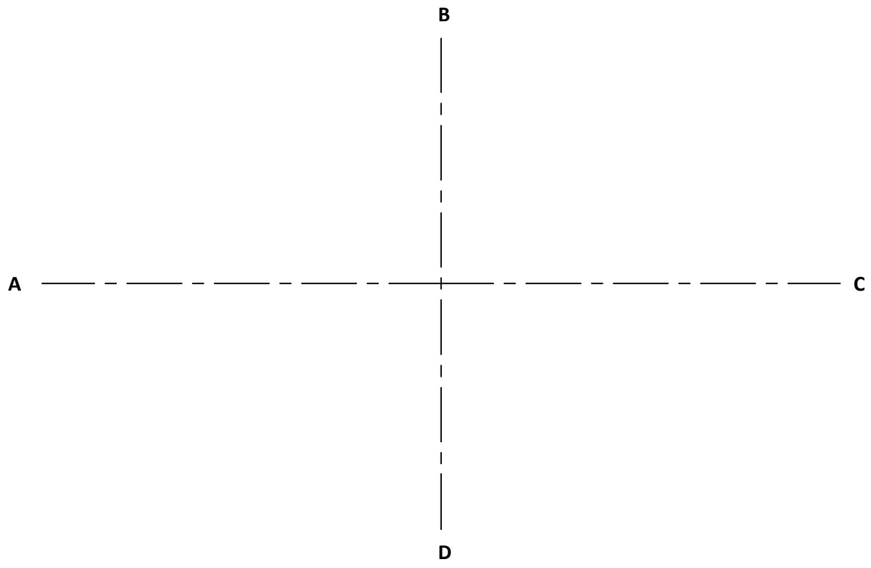
6. **(c)** Shown on the right is a dimensioned drawing of the toy skid steer.

The curve **ABCD** is an ellipse. **AC** is the major axis and **BD** is the minor axis of the ellipse.
The line **LM** is tangent to the ellipse at point **P** on the curve.

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

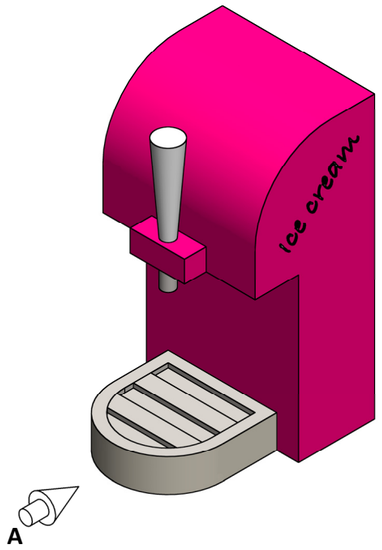
(ii) Using the dimensions given, complete the drawing of the toy skid steer.



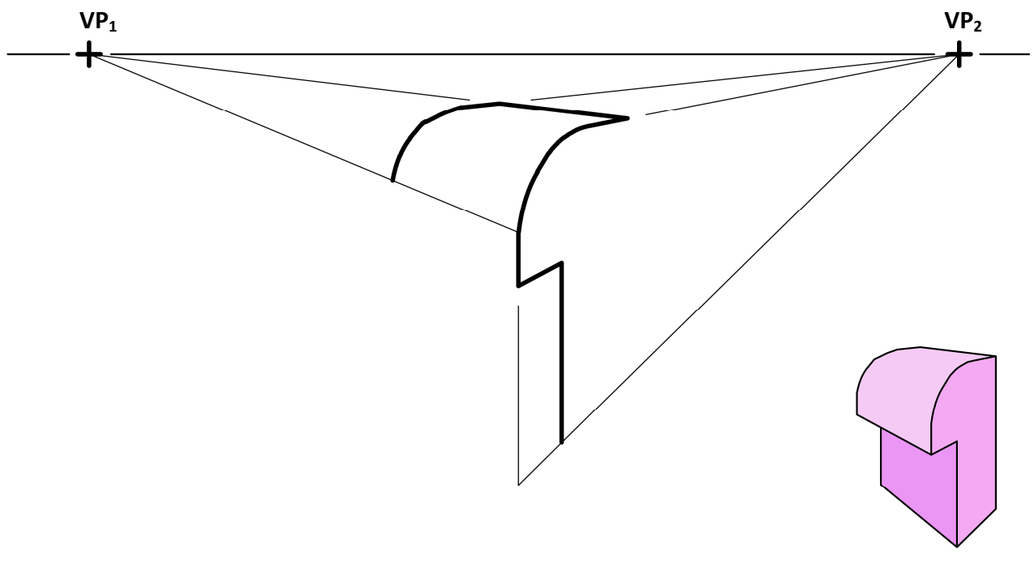


7. Shown below is a 3D model of an ice cream machine.

(a) In the space provided draw a well proportioned freehand sketch of the elevation of the ice cream machine in the direction of arrow **A**.

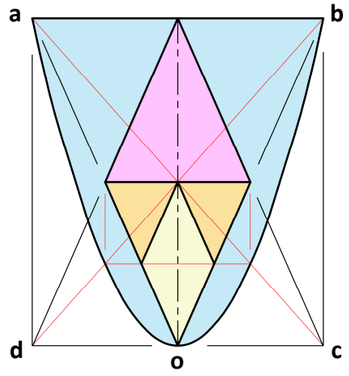


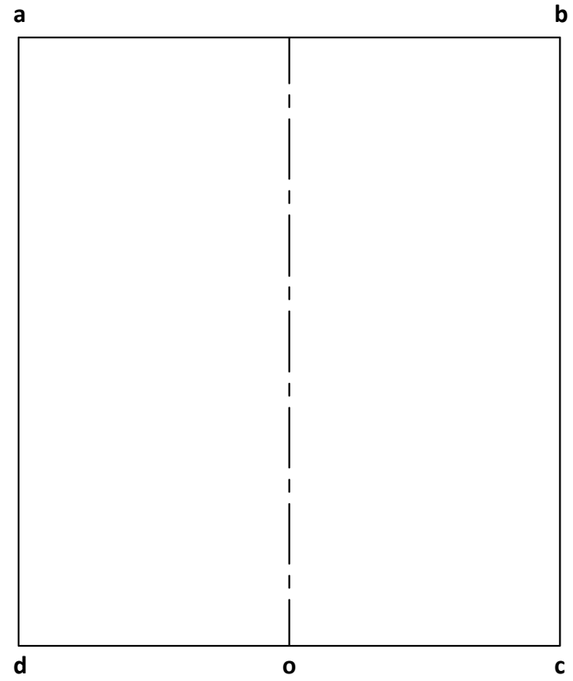
(b) The drawing below shows the incomplete perspective drawing of the ice cream machine body.
A 3D graphic is also shown. Complete the perspective drawing.



(c) The logo of the ice cream machine is shown below.
It is based on a parabola **aob** with vertex at **o**, a rectangle and triangles.
Redraw the logo in the given rectangle **abcd**.

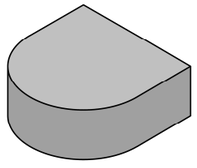
Colour **or** shade the completed logo.

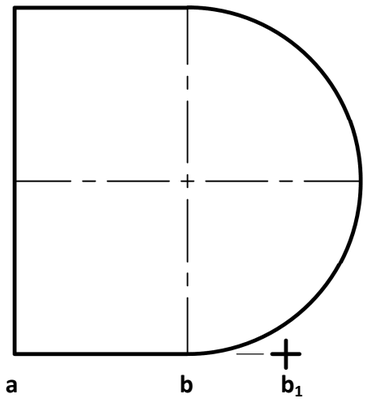




(d) A 3D model of the drip tray, removed from the machine is shown below.
Also shown is the plan of the drip tray.

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

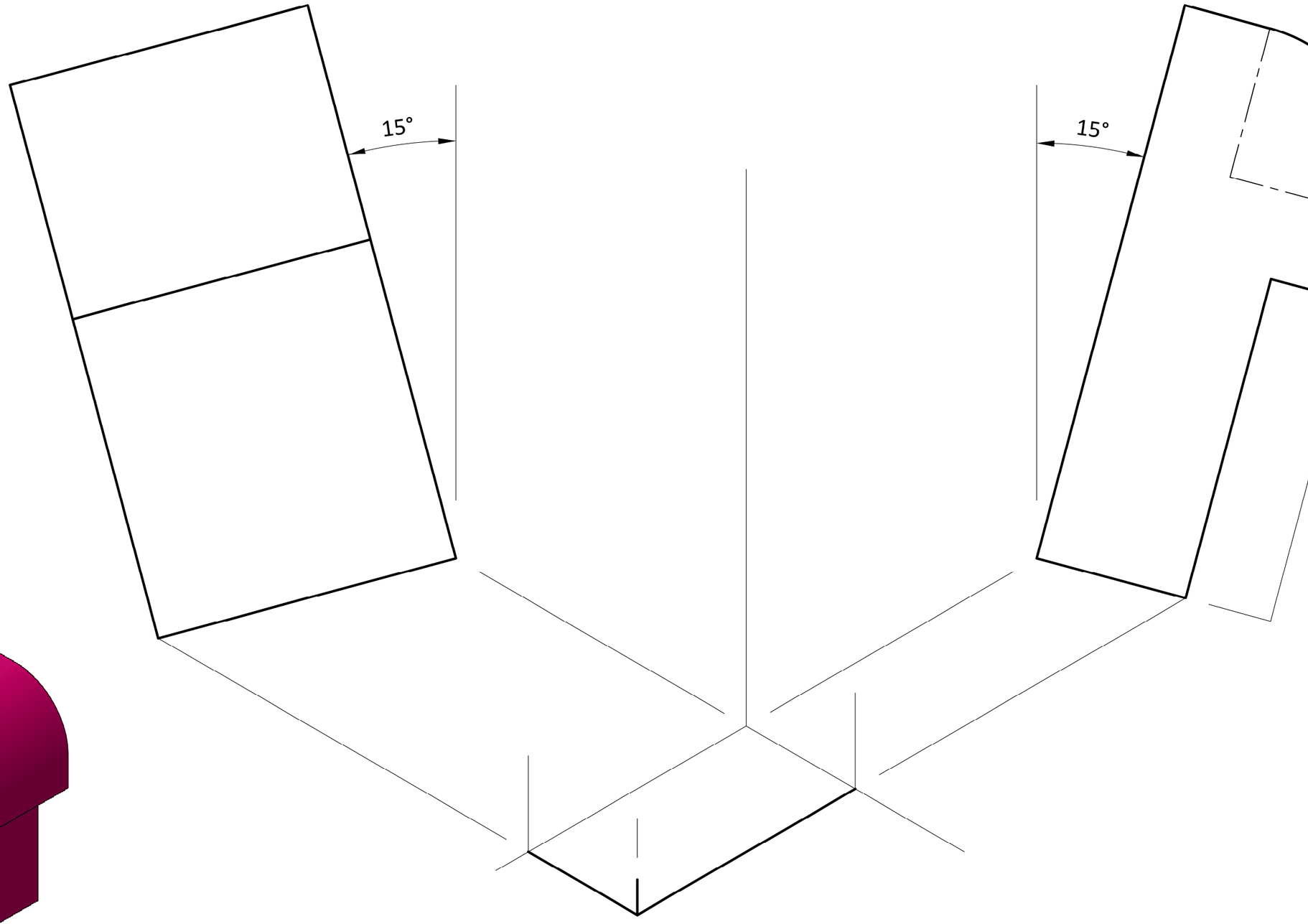


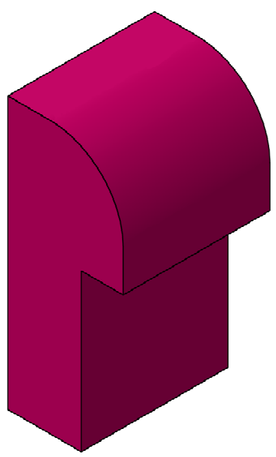


7. **(e)** The axonometric axes required for the isometric projection of the ice cream machine body are shown.

The elevation, end elevation and a 3D graphic of the ice cream machine body are also shown.

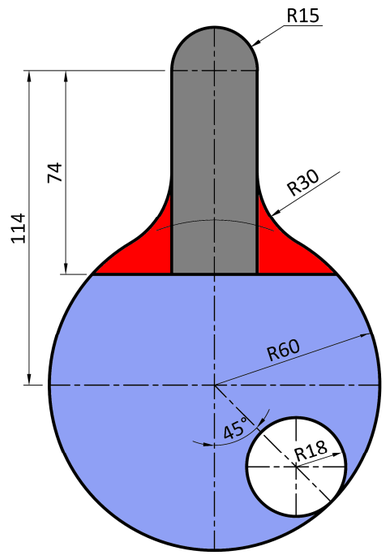
Complete the axonometric projection of the ice cream machine body.





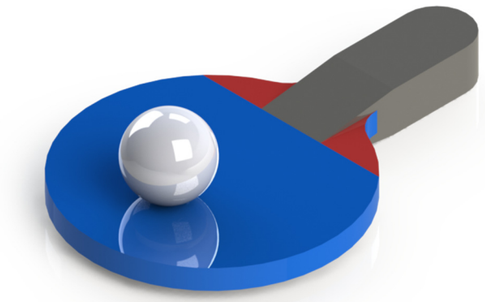
8. **(a)** A logo for a table tennis club is shown on the right.
Using the dimensions given, redraw the logo on the given centreline.

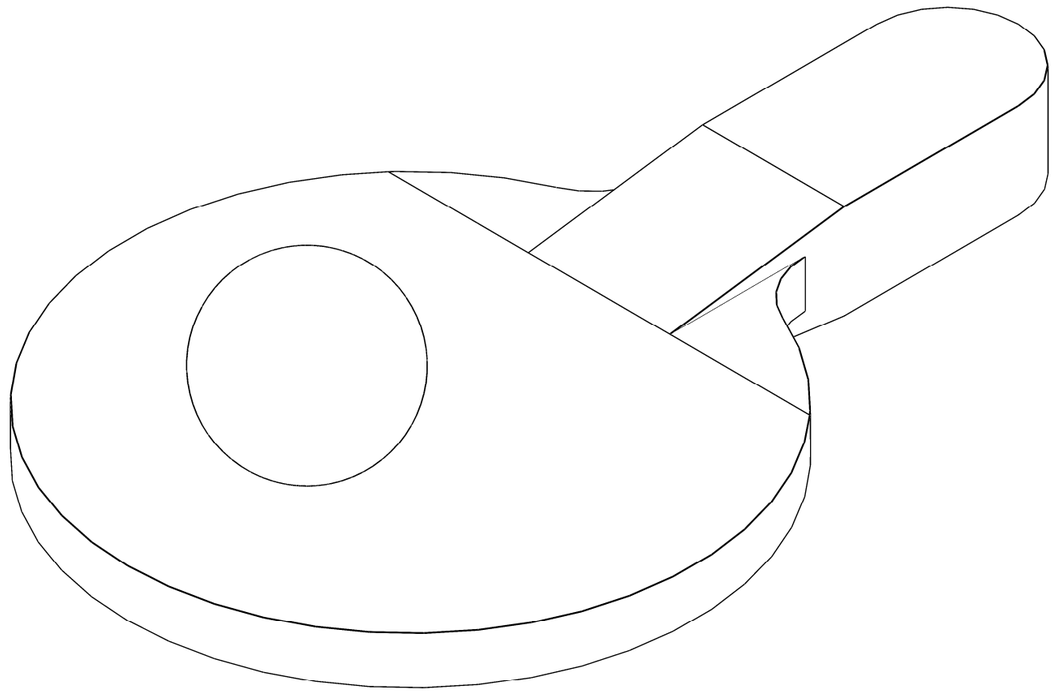
Show all construction lines, tangents and points of contact.



(b) The image below shows a table tennis ball sitting on a table tennis bat.
Also shown below is a line drawing of a similar ball and bat.

Apply appropriate shading **or** render to the drawing to achieve a 3D effect.





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Junior Cycle Final Examination Sample Paper – Common Level

Graphics

2 hours