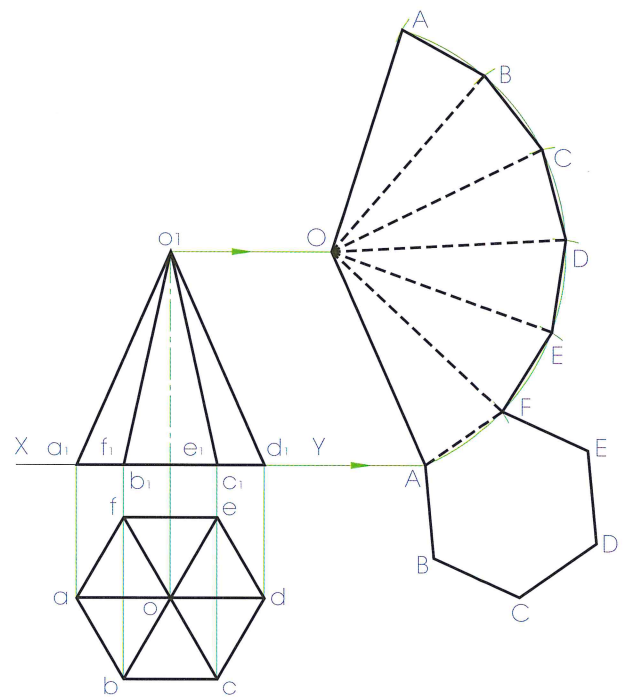
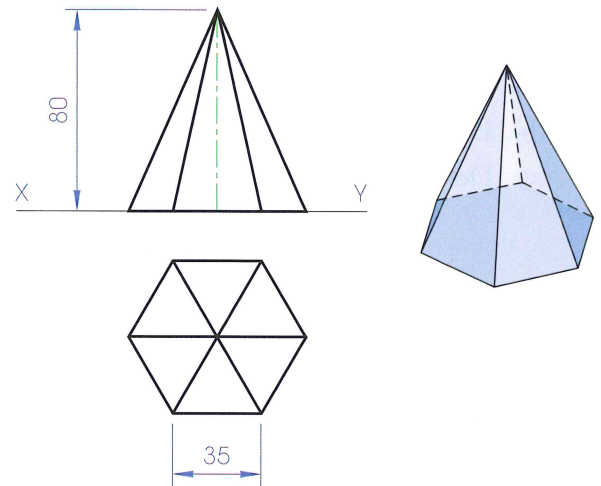


Radial-line Developments

Example 1

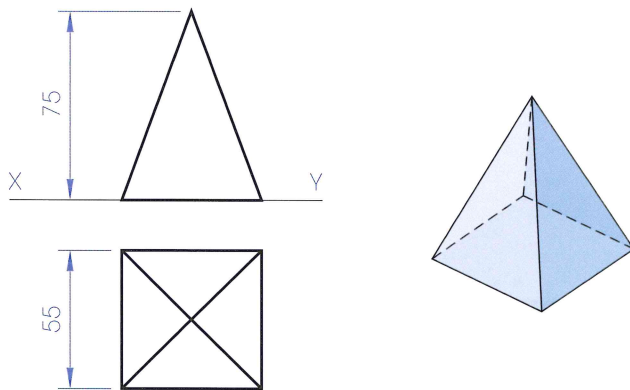
The elevation and plan of a **regular hexagonal pyramid** are shown across. Draw the given views and determine the complete **development** of the pyramid.

1. The plan and elevation are drawn as shown.
2. The development will consist of six congruent isosceles triangles and a regular hexagon.
3. The edge OD appears in true length in elevation and can be translated to the development as shown. The lateral edges will radiate from O along an arc with radius equal to the true length of OD.
4. The base of each triangle will be 35 mm long i.e. equal to the length of the base edges of the pyramid.
5. The base of the pyramid appears in true shape in plan and can be redrawn in the development.

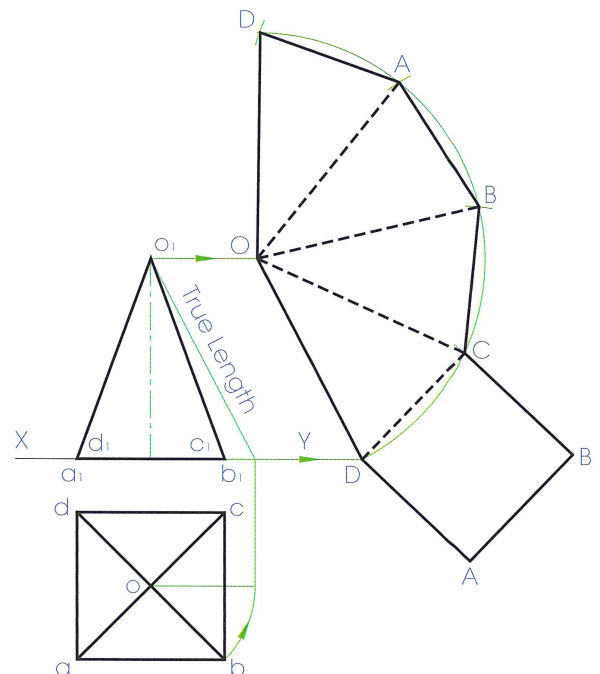


Example 2

The elevation and plan of a **square pyramid** are shown below. Draw the given views and determine the complete **development** of the pyramid.



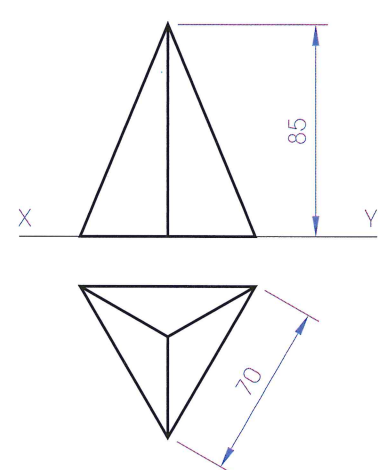
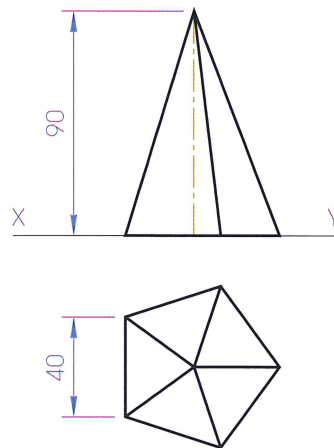
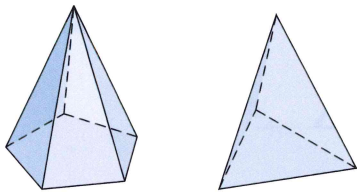
1. The plan and elevation are drawn as shown over.
2. The development will consist of four congruent isosceles triangles and a square.
3. The true length of the edge OB can be determined by rotating it until it is parallel to the vertical plane as shown. This true length gives the radius of the arc for the lateral edges.
4. The true length of the base of each triangle will be 55 mm long allowing the development to be completed as shown.



Exercise

The elevation and plan of a **two regular pyramids** are shown over. In each case:

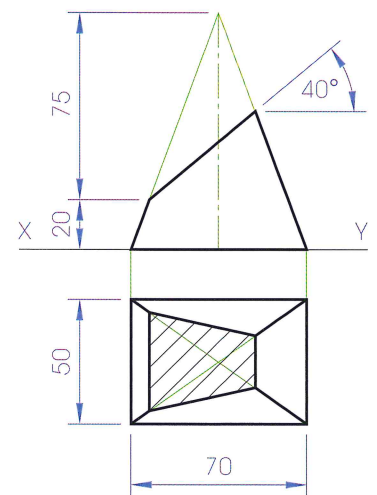
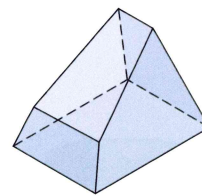
- Draw the given views.
- Draw the complete **development** of the pyramid.



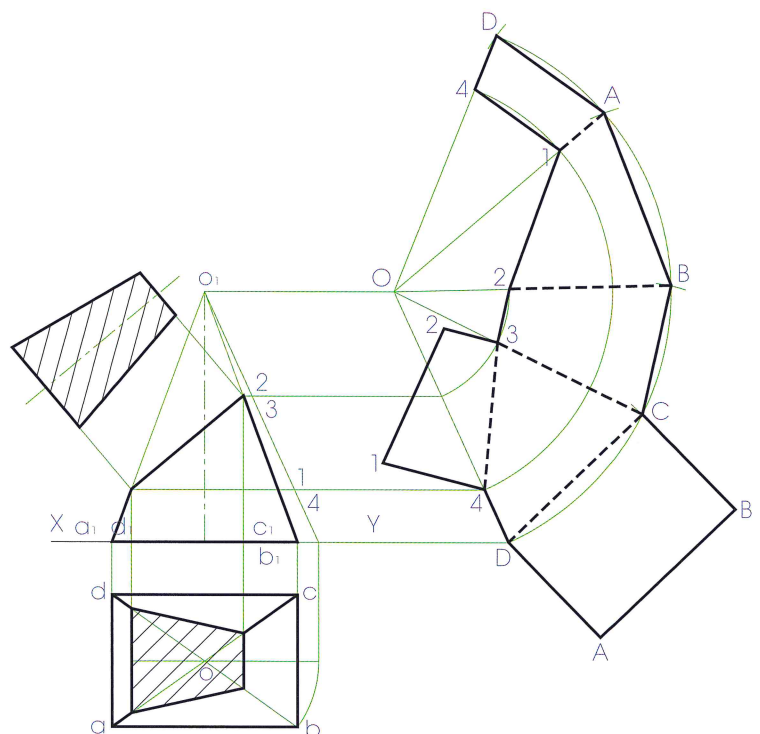
Example

The elevation and plan of a **truncated rectangular pyramid** are shown over.

- Draw the given views.
- Determine the **true shape** of the cut section of the solid.
- Draw the complete **development** of the truncated pyramid.

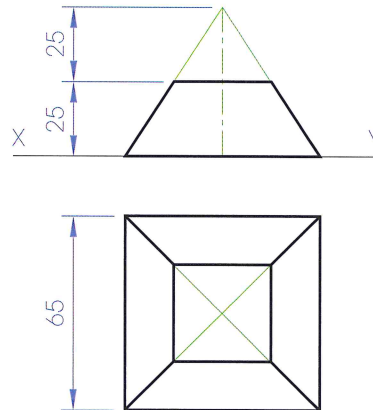
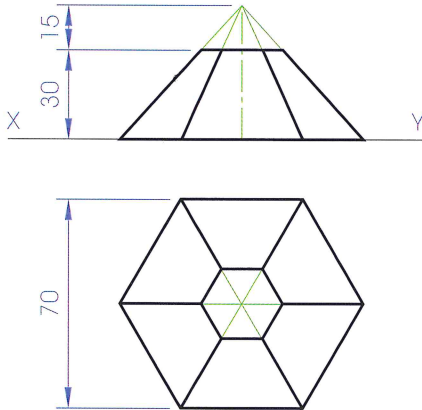


- The elevation, plan and true shape are drawn as shown over.
- The development of the truncated pyramid is constructed by first developing the whole pyramid. This is done using the procedure that was used in the previous example but the lateral edges must be drawn lightly.
- Then the portion containing the apex is removed. This is achieved by locating the points where the cutting plane meets the lateral edges in the true length view and transferring these points to the development.
- The base and true shape of the cut section are redrawn in the development allowing it to be completed as shown.

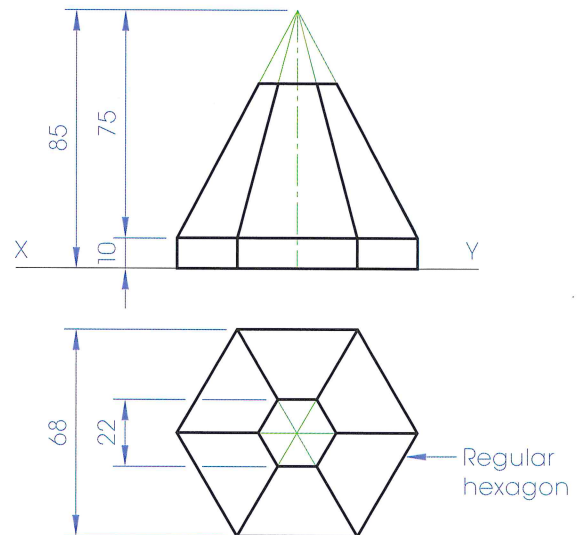
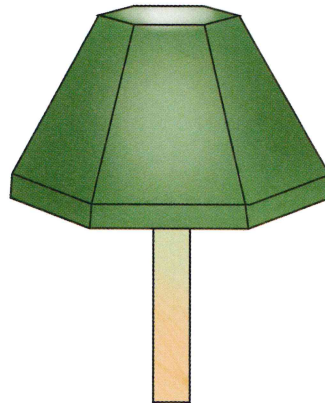


Exercises

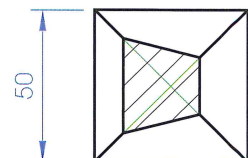
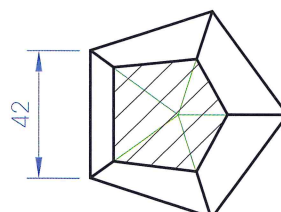
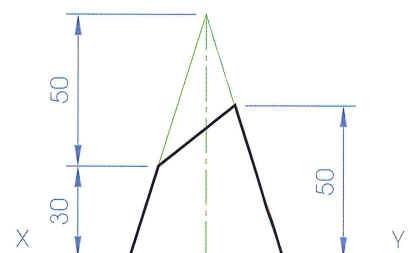
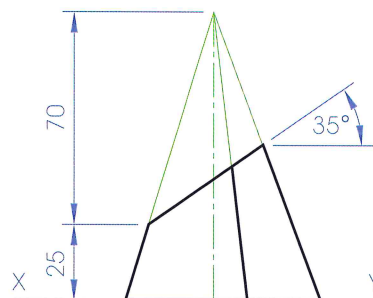
1. The figure below shows the elevation and plan of two **light shades**. Each shade is based on a frustum of a **regular pyramid**. In each case:
- Draw the given views.
 - Draw the complete **development** of the shade.



2. The elevation and plan of a light shade for a **table lamp** are shown over.
- Draw the given views.
 - Draw the complete **development** of the light shade.



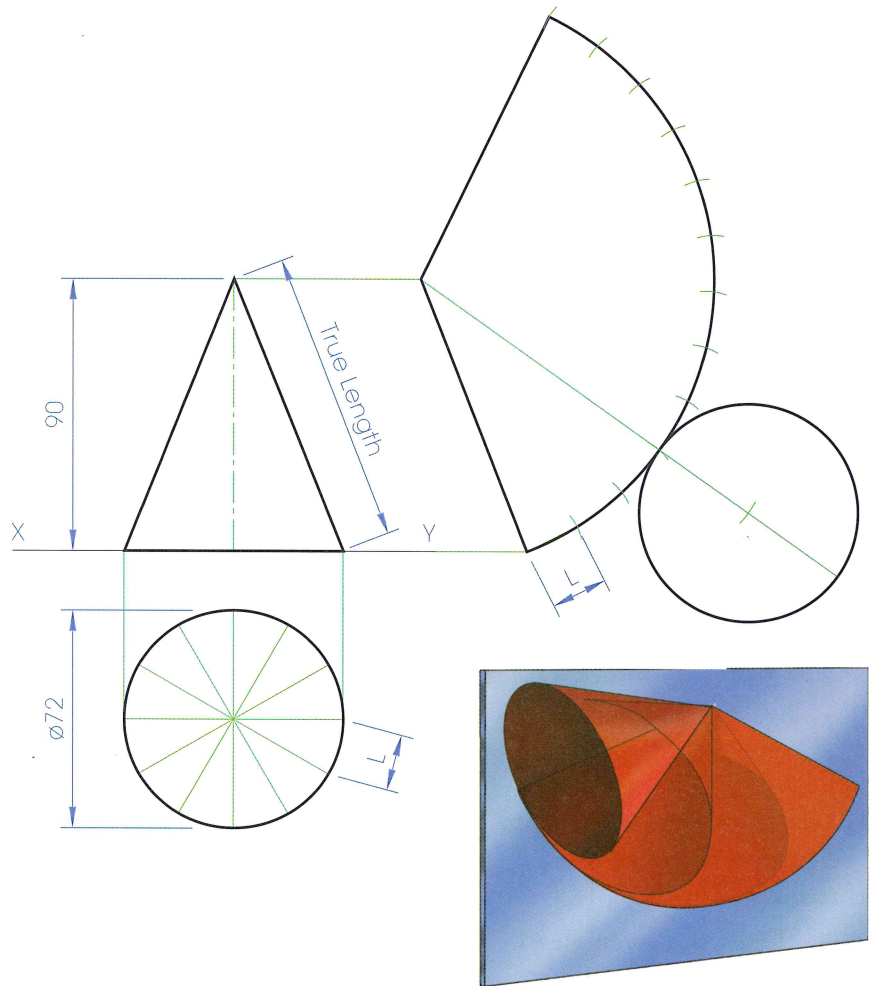
3. The figure over shows the elevation and plan of two **truncated regular pyramids**. In each case:
- Draw the given views.
 - Determine the **true shape** of the cut section of the solid.
 - Draw the complete **development** of the truncated pyramid.



Example 1

The elevation and plan of a **cone** are shown over. A **development** of the cone is also shown.

1. From the illustration, far right, it can be seen that the development of the curved surface of a cone is a sector of a circle. The radius for the sector will be equal to the true length of the elements of the cone, which can be transferred from the elevation.
2. The length of the arc can be approximated by dividing the plan of the cone into twelve equal parts and setting out the resulting chord distance twelve times as shown.
3. The base, which appears in true shape in plan, can be redrawn to complete the development.

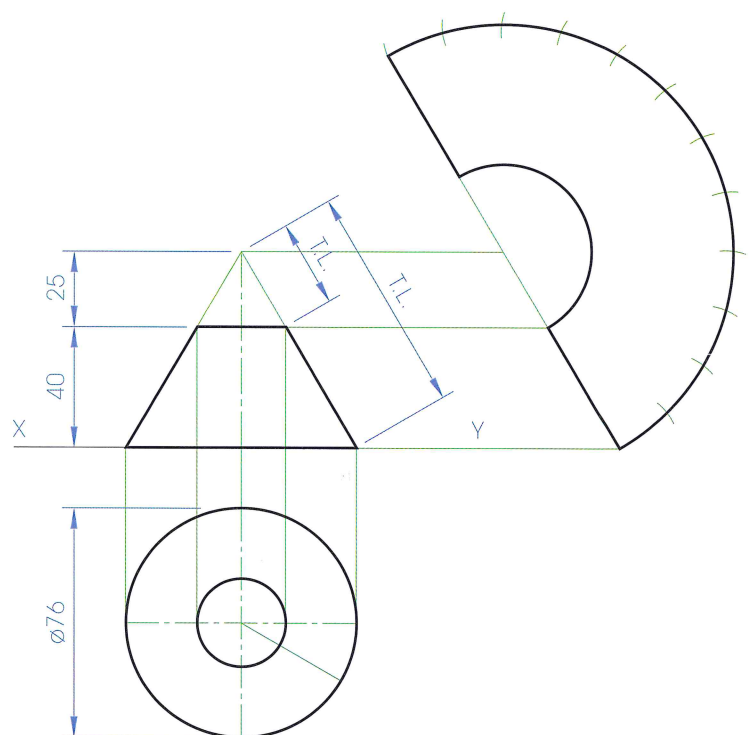


The development of the curved surface of a cone is a sector of a circle.

Example 2

The elevation and plan of a **shade** for a table lamp, which is based on a **frustum of a cone** are shown over. A **development** of the shade is also shown.

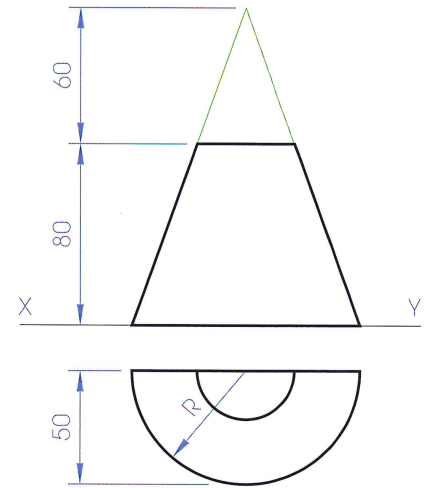
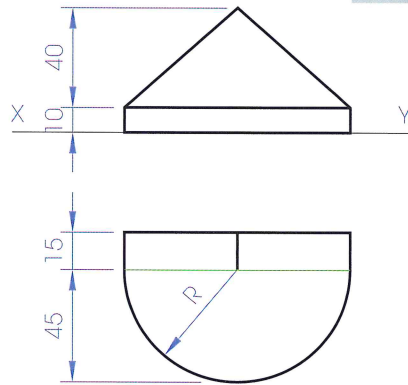
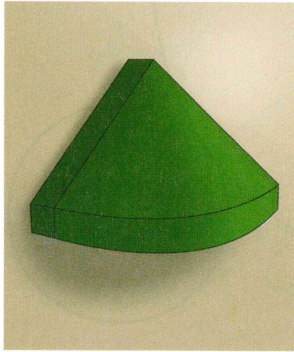
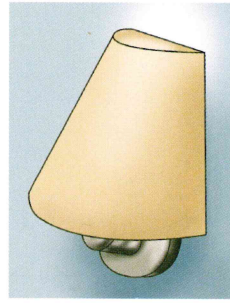
1. The development is constructed by first developing the complete curved surface of the cone as in the previous example.
2. Then the portion containing the apex is removed as shown.



Exercise

The elevation and plan of a **canopy** and a **shade for a wall light** are shown below. In each case:

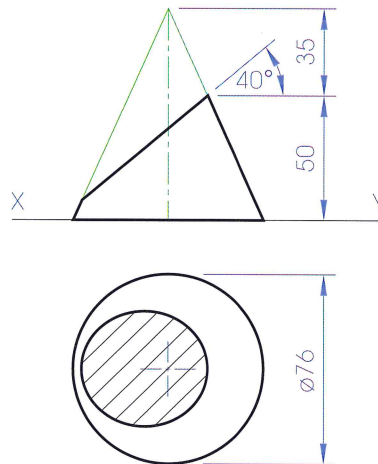
- Draw the given views.
- Draw the complete **development** of the object.



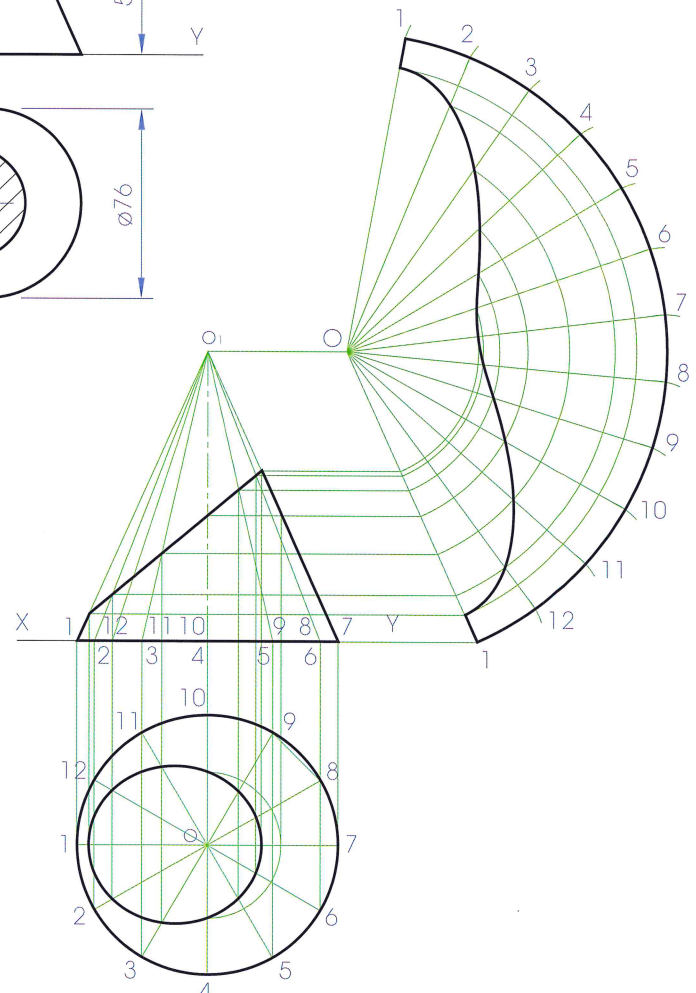
Example

The figure over shows the elevation and plan of a **truncated cone**.

- Draw the given views.
- Determine the **development** of the curved surface of the truncated cone.

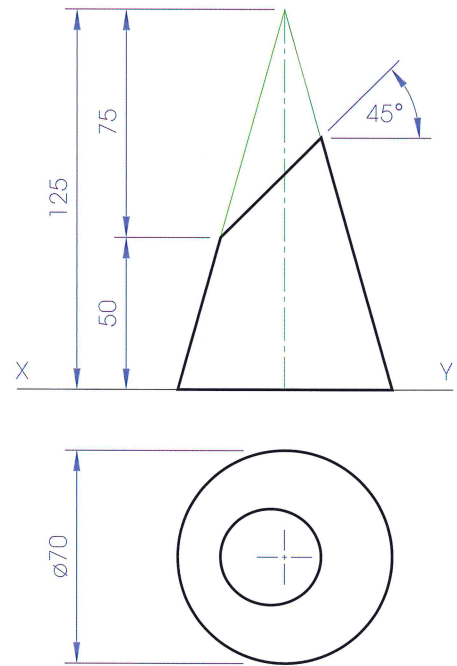


- The outline plan and elevation are drawn in the normal manner.
- The plan of the cut section is drawn by determining the plan of twelve equally spaced truncated elements on the cone as shown over. The truncation of elements O-4 and O-10 are determined in plan using a horizontal section.
- The development of the truncated cone is constructed by first developing the whole cone and drawing in the elements as shown.
- The portion containing the apex is then removed. This is done by locating the relevant points on the truncated elements in the true length view as shown and transferring them to the development.



Exercises

1. The elevation and plan of the body of a **coal scuttle** are shown over.
 - (a) Draw the given views.
 - (b) Draw the complete **development** of the body of the coal scuttle.



2. The figure below shows the elevation and plan of a **truncated solid**.
 - (a) Draw the given views.
 - (b) Determine the **true shape** of the cut section of the solid.
 - (c) Draw the complete **development** of the solid.

