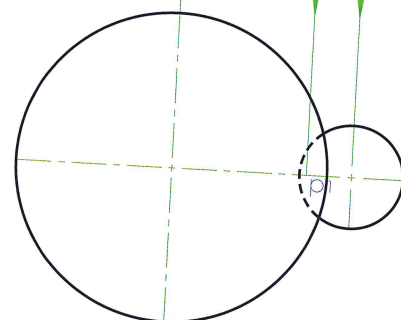
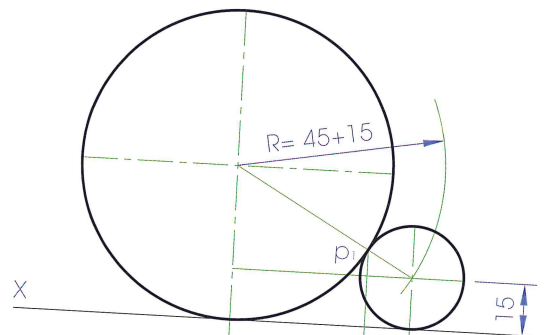
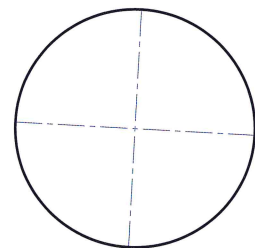
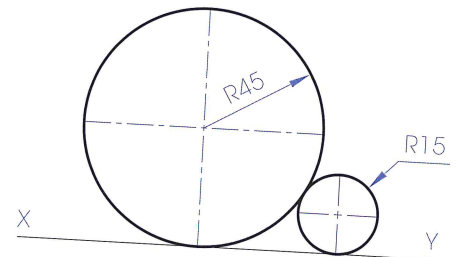
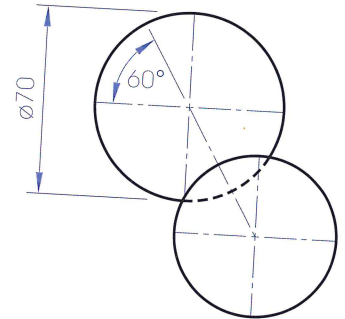
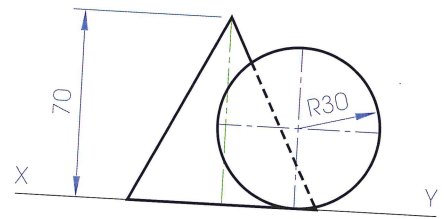
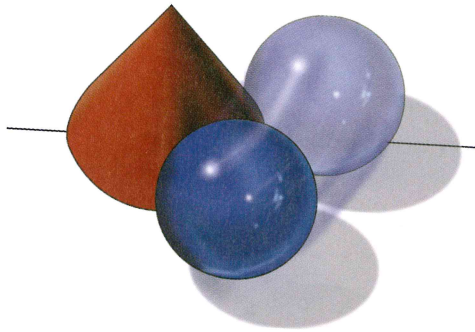


**Exercise**

The elevation and plan of a **cone** and **sphere** in mutual contact are shown over.

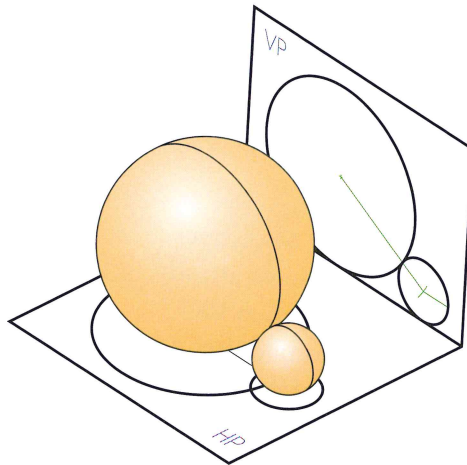
- Draw the elevation and plan of the solids.
- Locate the point of contact in both views.

**Example 1**

The elevation and incomplete plan of **two spheres** in mutual contact are shown over.

- Draw the complete elevation and plan of the solids.
- Locate the point of contact in both views.

- First draw the plan and elevation of the sphere of radius 45 mm as given.
- The elevation of the second sphere will be tangential to the XY line and the first circle in elevation. Therefore its centre will lie on a horizontal line 15 mm from the XY line in elevation.
- Its centre will also lie on an arc of radius 60 mm ( $45 + 15$ ) drawn from the centre of the first circle. The resulting point of intersection is the centre for the second sphere in elevation, allowing it to be drawn, as shown over.
- The centre of the second sphere can be projected to lie on the extended diameter parallel to the XY line in plan allowing both solids to be lined in as appropriate.
- The point of contact between the two spheres (P) will lie on the line joining their centres. It can be located in elevation and projected to plan as shown.



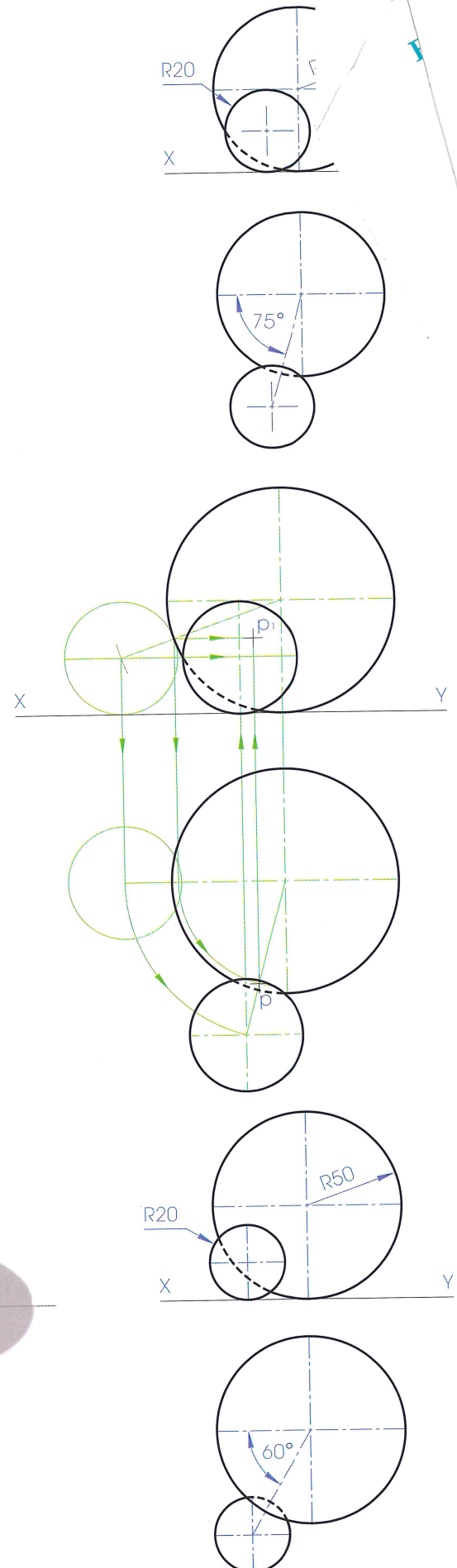
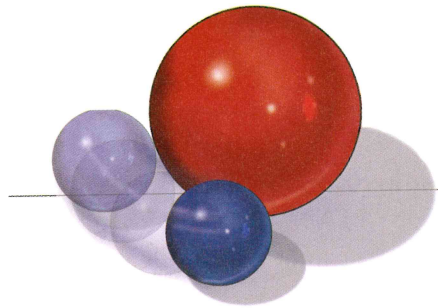
The point of contact between two spheres lies on the line joining their centres.

**Example 2**

The elevation and plan of **two spheres** in mutual contact are shown over.

- Draw the elevation and plan of the solids.
- Show the position of the point of contact in both views.

- First draw the plan and elevation of the sphere of radius 40 mm lightly.
- Imagine that the second sphere has been rotated along the HP about the centre of the first sphere until it appears tangential to the first sphere in elevation as illustrated pictorially over. The elevation and plan of the second sphere can be drawn lightly in this rotated position as in the previous example. The point of contact (P) can also be located.
- Then imagine that the second sphere is rotated back into its original position. In plan the centre of the sphere and the point of contact will rotate in circular arcs about the centre of the first sphere until they lie on the line inclined at  $75^\circ$ . This allows the plan to be completed.
- The final resting position of the centre and point of contact can be projected to elevation where their heights have already been established as shown over. The elevation can then be lined in as appropriate. Note that the point of contact lies on the line joining the centres of the spheres in elevation also.

**Exercise**

The elevation and plan of **two spheres** in mutual contact are shown over.

- Draw the elevation and plan of the solids.
- Locate the point of contact in both views.

