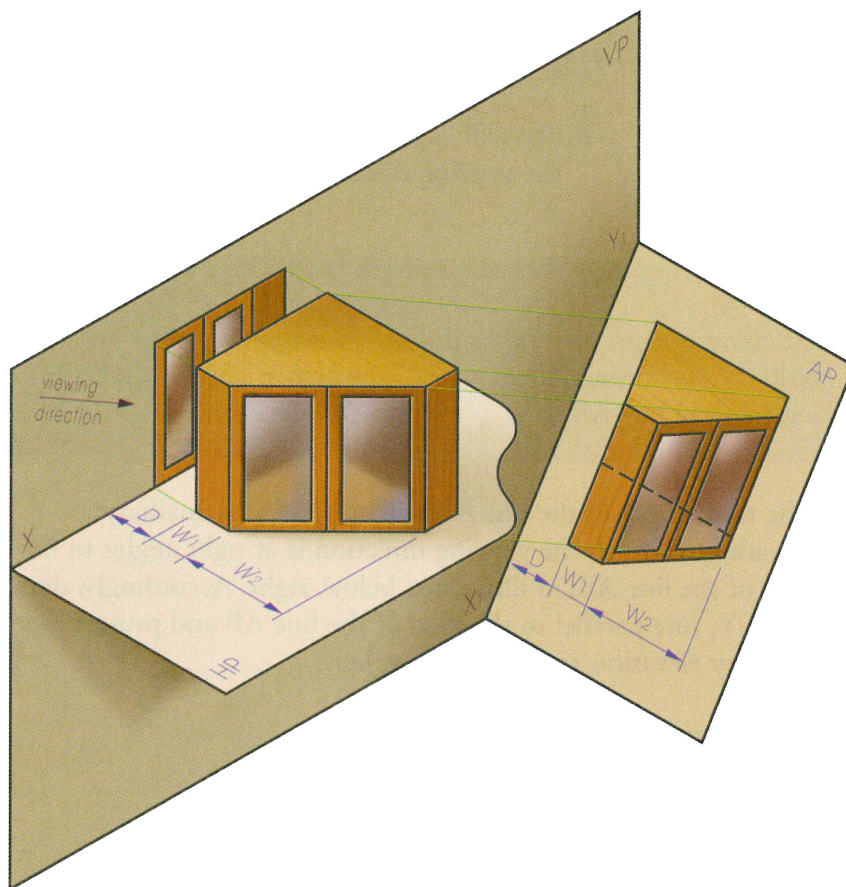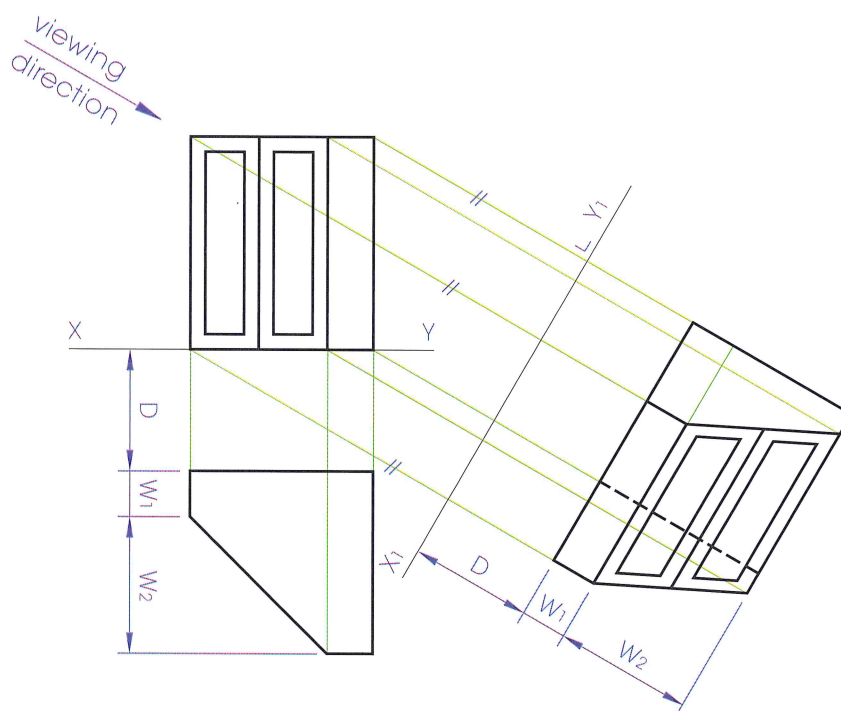# Auxiliary Plans

Auxiliary plans can be obtained by changing the viewing direction also. Take for example the pictorial view of the corner unit shown over. It shows:

(i) A viewing direction inclined to the HP.

(ii) An auxiliary plane (AP) positioned *at right angles to the inclined viewing direction.*

(iii) The auxiliary plan of the unit obtained by projecting points on the object perpendicularly onto the AP and joining them in order.

The planes are rotated into one plane allowing the views to be transferred to a sheet of paper as shown below.

The line of intersection between the auxiliary plane and the vertical plane is called the X_1Y_1 line.


Note that the widths in the auxiliary plan are the same as those in the plan. This facilitates an efficient method of constructing auxiliary plans as shown in the following example.

Example

The elevation and plan of a solid which forms the basis for a **corner unit** is shown over.

(a) Draw the given views.

(b) Draw an **auxiliary plan** of the solid with the viewing direction as indicated by the arrow.
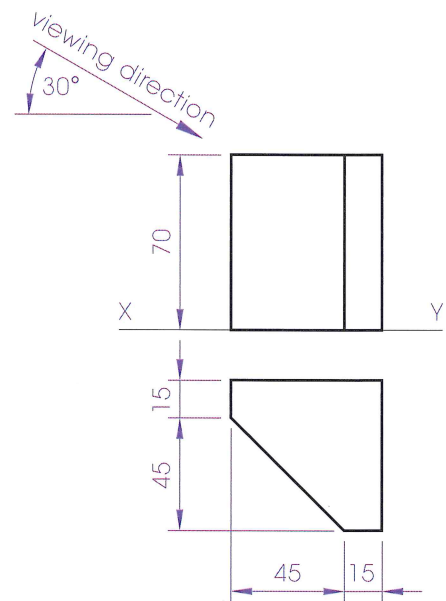
1. The elevation and plan are drawn in the normal manner.

2. Draw the X_1Y_1 line in any convenient position at right angles to the viewing direction for the auxiliary plan.

3. Project all points on the object from the elevation at right angles to the X_1Y_1 line.

4. Transfer the widths from the plan to the auxiliary plan as indicated below, left.

5. Line in the auxiliary plan as shown below, right.
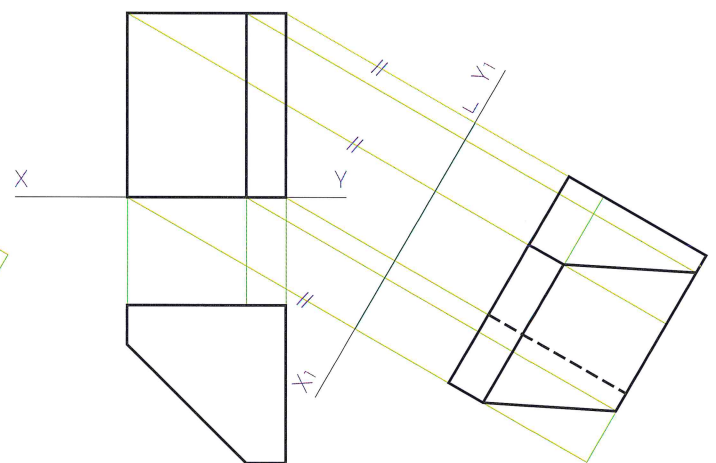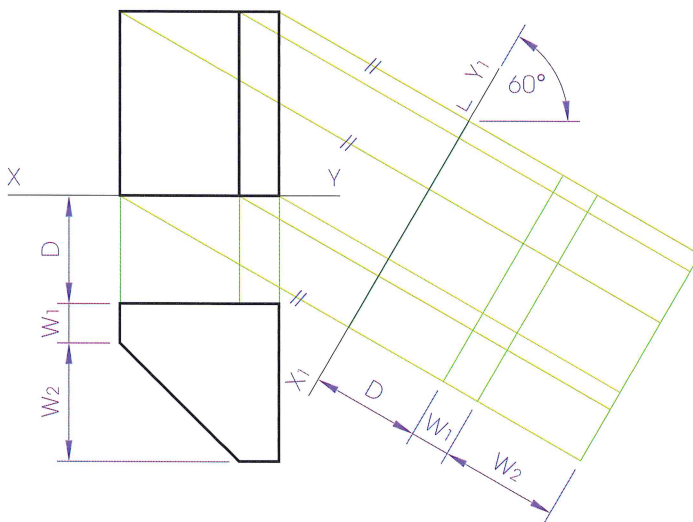
Exercises

1. The figure over shows the elevation and plan of the **Toblerone box** which is based on an equilateral triangular prism.

   (a) Draw the given views.

   (b) Draw an **auxiliary plan** of the box using the viewing direction indicated by the arrow.
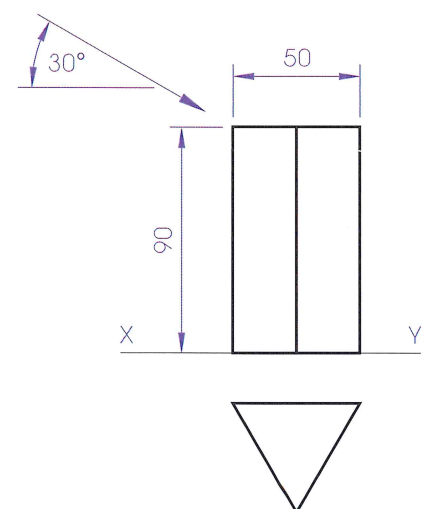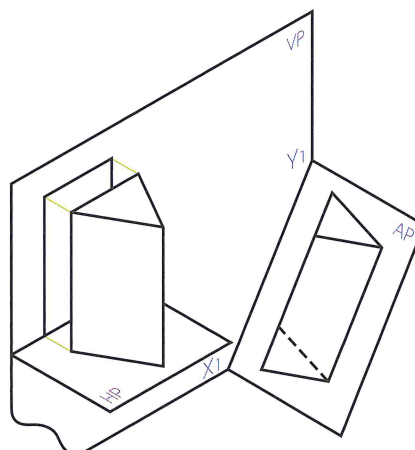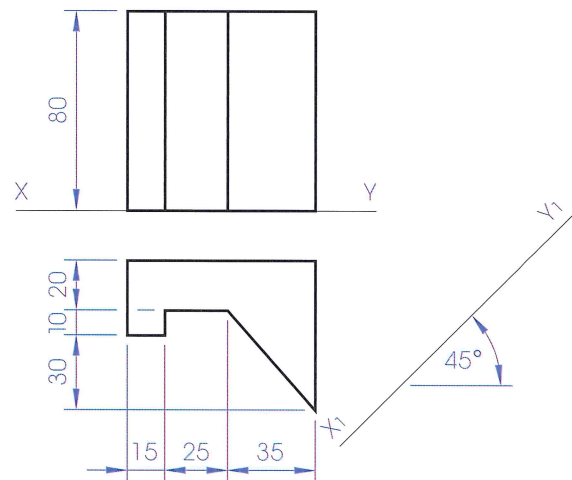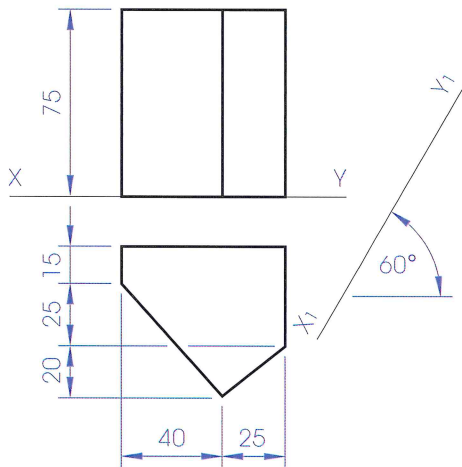
2. The elevation and plan of a
tea box are shown over.

(a) Draw the given views.

(b) Draw an **auxiliary
plan** of the box using
the viewing direction
indicated by the arrow.
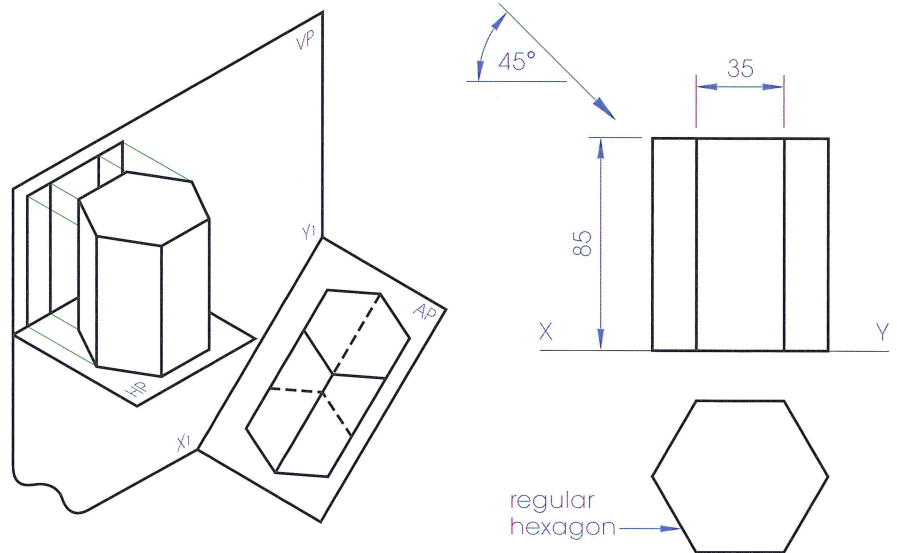
3. The elevation and plan of
two solids are shown below.
In each case:

(a) Draw the elevation and
plan as given.

(b) Draw an **auxiliary plan** of the solid on the X_1Y_1 line shown.

Determining True Shape using Auxiliary Plans

Earlier we determined the true shape of surfaces using auxiliary elevations having noted that:

> A surface will appear in true shape in a view in which the viewing direction is at right angles to that surface.

The same principles can be applied to auxiliary plans.

Example
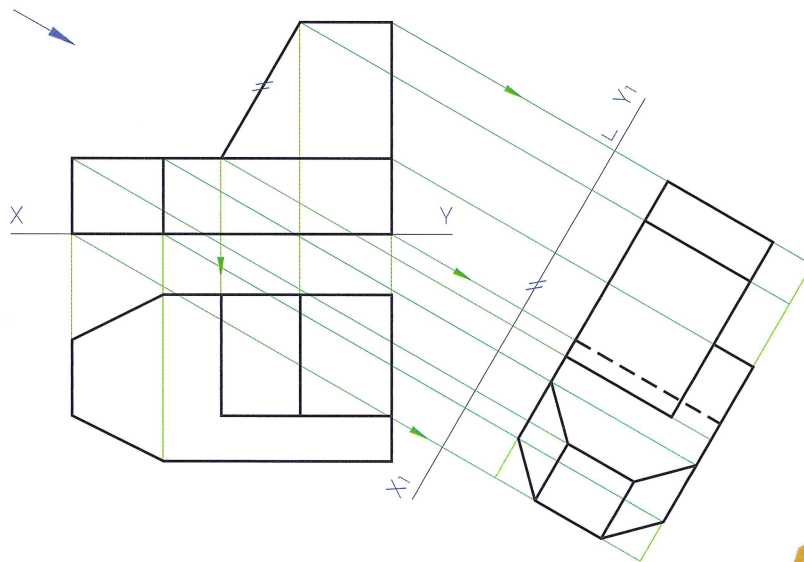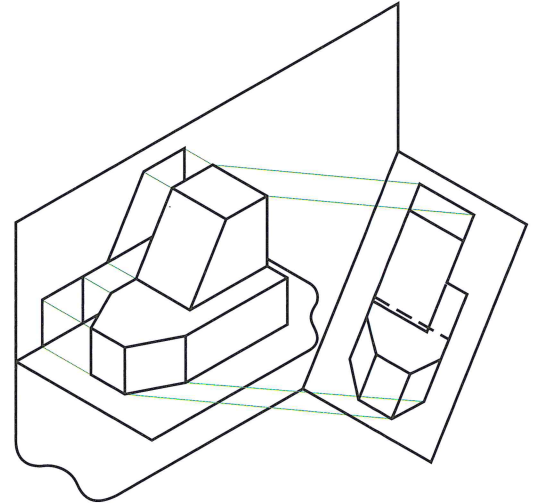The elevation and plan of a **solid** are shown over.

(a) Draw the given views.

(b) Draw an **auxiliary plan** of the *entire solid*,
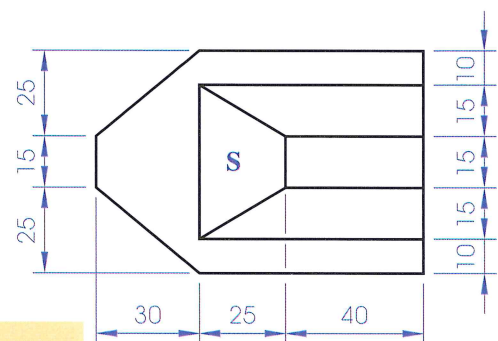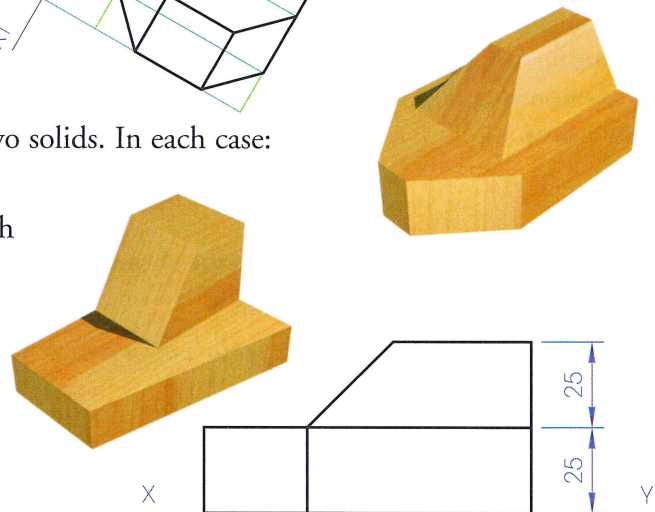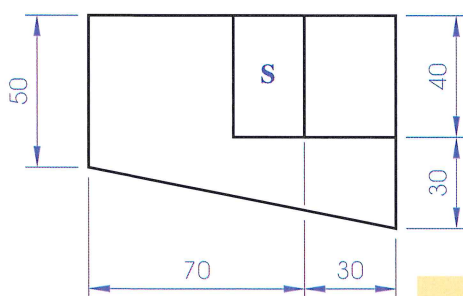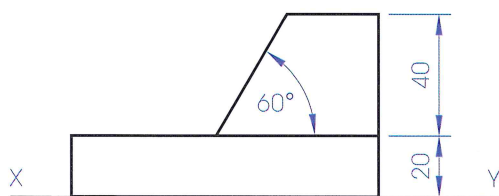which will show the true shape of the
surface S.
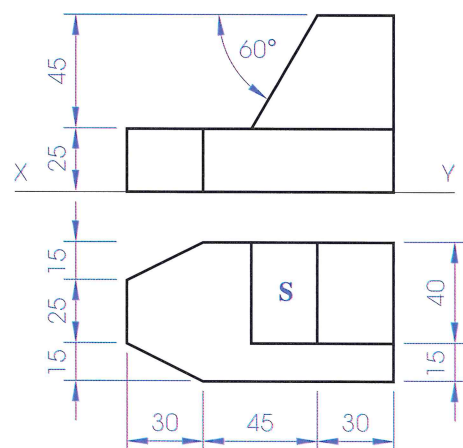
1. The elevation and plan are drawn as shown below.

2. The true shape of surface S will appear in an auxiliary plan in which the viewing direction is at right angles to that surface as illustrated over. Accordingly, the viewing direction will be ⊥ to surface S in elevation.

3. Draw the X_1Y_1 line in any convenient position ⊥ to the viewing direction (parallel to the elevation of surface) and project points on the object from the elevation at right angles to the X_1Y_1 line.

4. Transfer the widths from the plan to the auxiliary plan and complete the new view as shown below.

Exercises

The figure below shows the elevation and plan of two solids. In each case:

(a)   Draw the given elevation and plan.

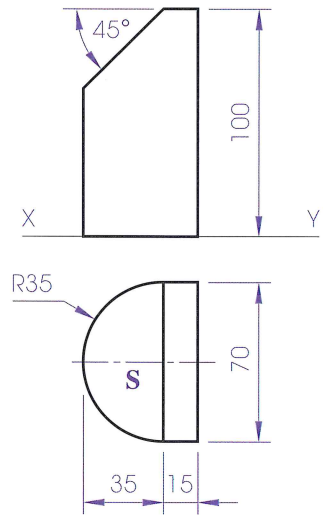(b)   Draw an **auxiliary plan** of the *entire solid*, which will show the true shape of the surface S.

Answer Worksheet 18F

Circles in Auxiliary Plans

Circles appear elliptical in auxiliary plans.

Example
The elevation and plan of a **bin** are shown over.

(a) Draw the given views.

(b) Draw an **auxiliary plan** of the *entire bin* which will show the true shape of the surface S.

1. The elevation and plan are drawn as shown over.

2. The viewing direction for the auxiliary plan will be ⊥ to the elevation of surface S. Draw the X_1Y_1 line ⊥ to the viewing direction (parallel to the elevation of surface S).

3. Complete the auxiliary plan of the object, excluding the curves, in the normal manner.

4. Locate additional points on the plan of the curves (use 30° divisions for convenience) and project them to the elevation.

5. Then locate these points in the auxiliary plan by transferring the appropriate widths and draw smooth curves to pass through them as shown over.
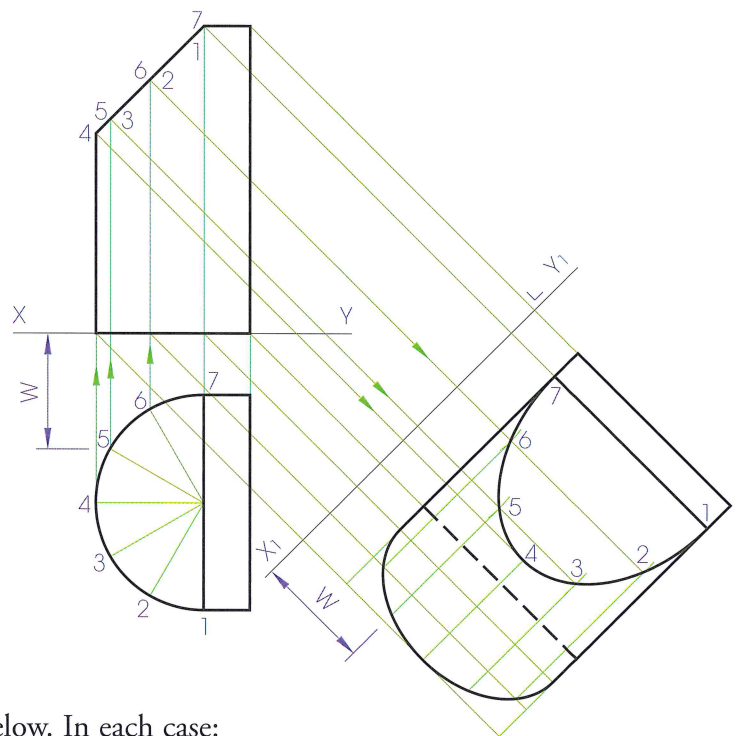
Exercises

The elevation and plan of two objects are shown below. In each case:

(a) Draw the given elevation and plan.

(b) Draw an **auxiliary plan** of the *entire object* which will show the true shape of the surface S.

Answer Worksheet 18G