Circles in Auxiliary Elevations

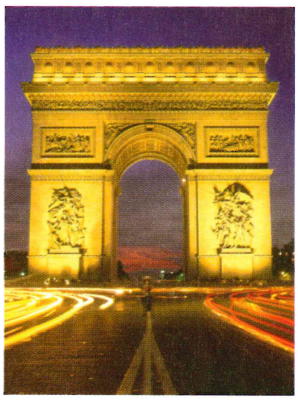
Circles appear elliptical in auxiliary elevations.

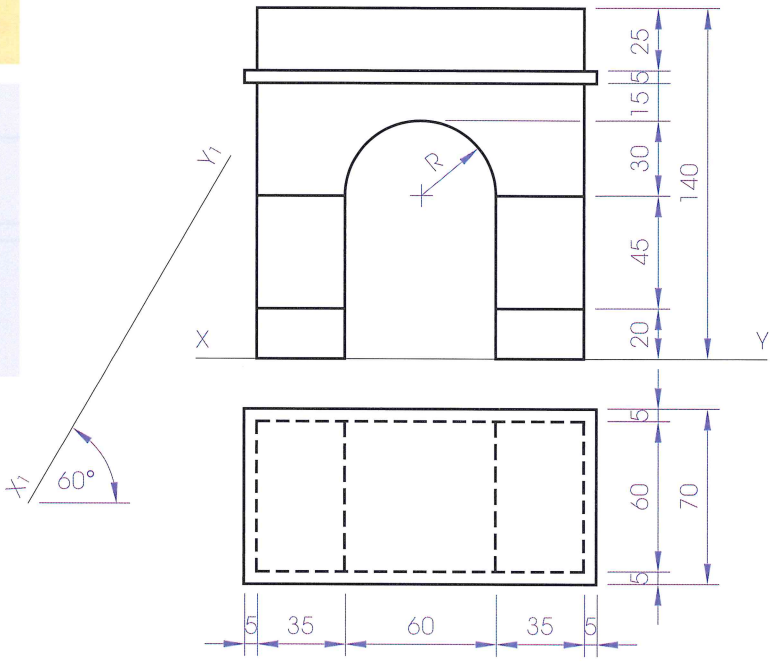
Example

The elevation and plan of an archway based on the **Arc de Triomphe** are shown over.

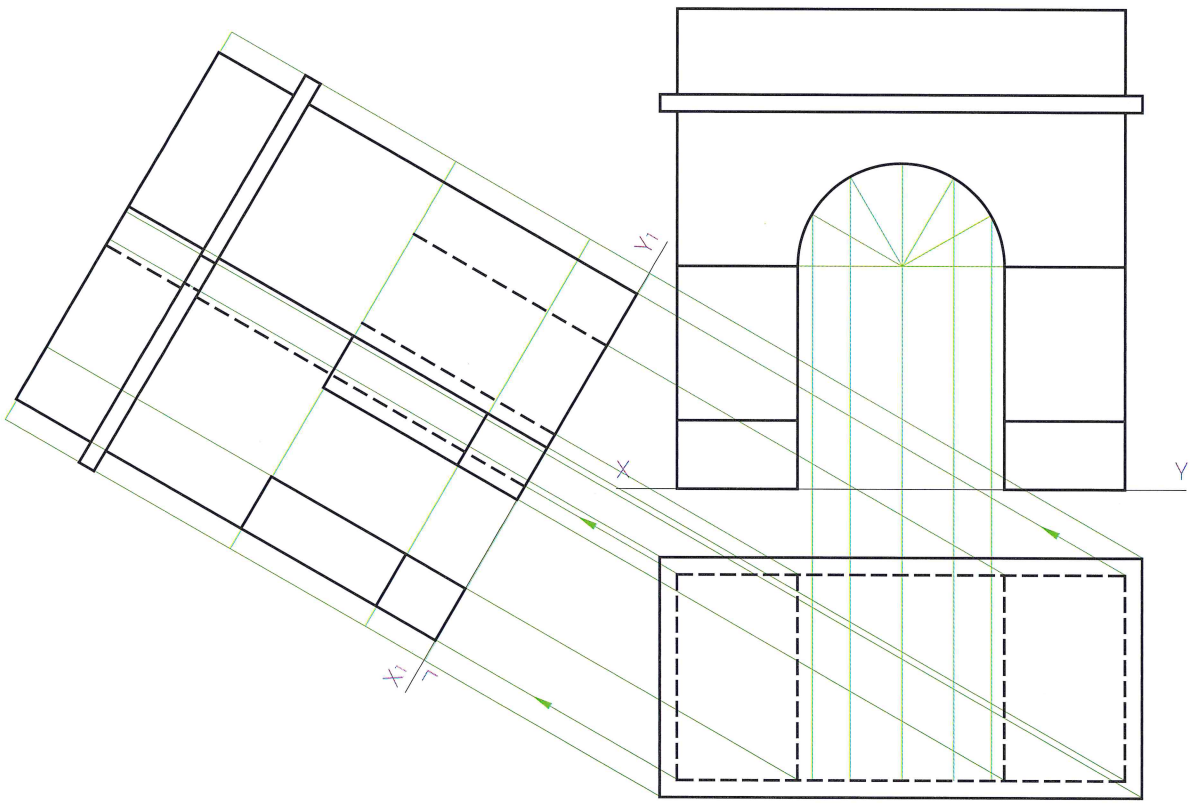
(a) Draw the given views.

(b) Draw an **auxiliary elevation** of the *entire archway* on the given ground line X_1Y_1.

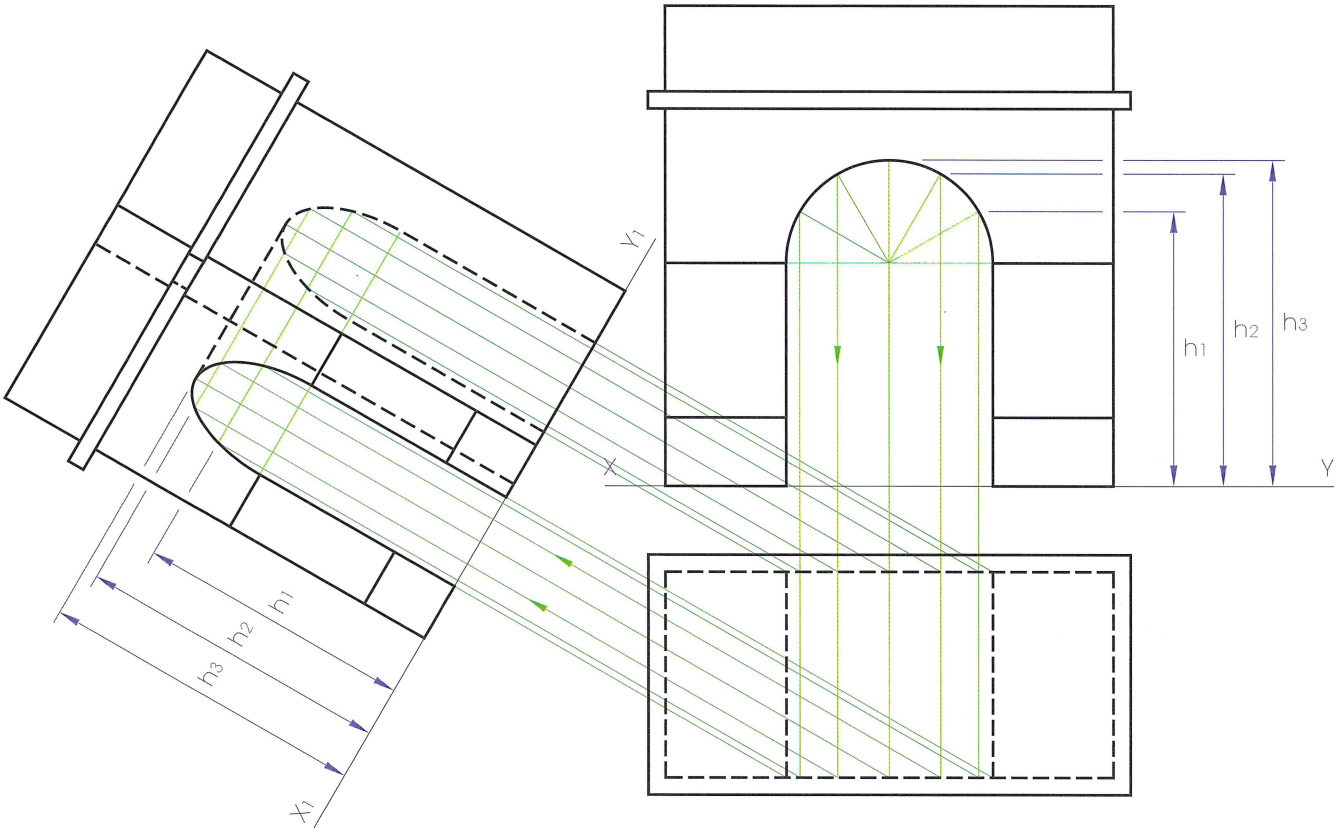




1. The elevation and plan are drawn as shown below.
2. Set up the auxiliary elevation of the archway in the normal manner, omitting the curved surface.
3. Locate points on the elevation of the semicircles (use 30° divisions for convenience) and project them to the plan.

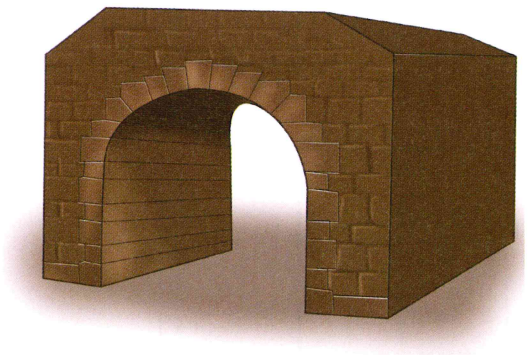


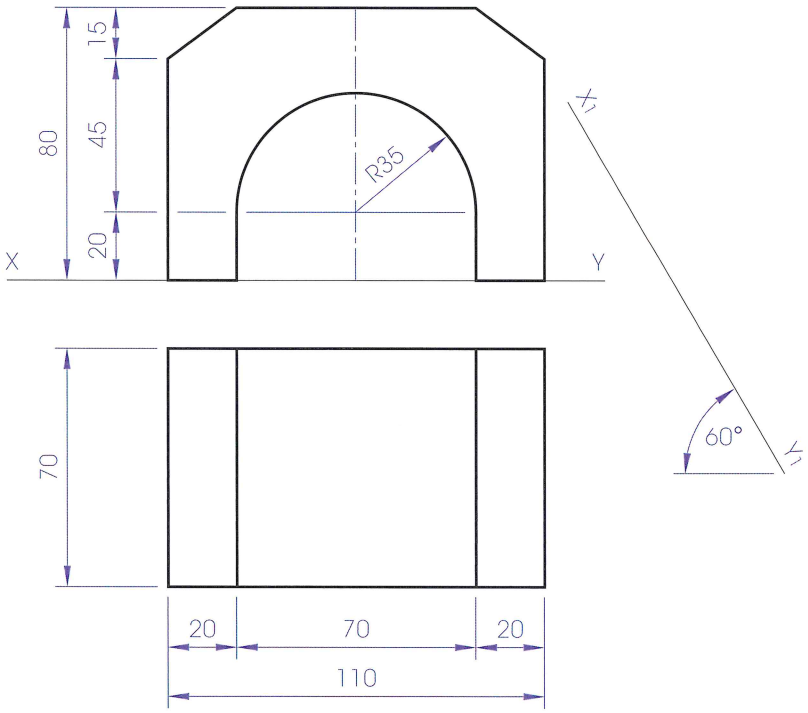
4. The semicircles will appear as semi-ellipses in the auxiliary view. These curves can be drawn by first projecting the points on the plan of the semicircles to the auxiliary view as shown below.
5. Then transfer the heights of these points from the front elevation to the auxiliary elevation and join them in order. Some construction lines have been omitted below for clarity.



Exercises

1. The elevation and plan of an **archway** are shown across.
   (a) Draw the given elevation and plan.
   (b) Draw an **auxiliary elevation** of the *entire archway* on the given ground line X_1Y_1.

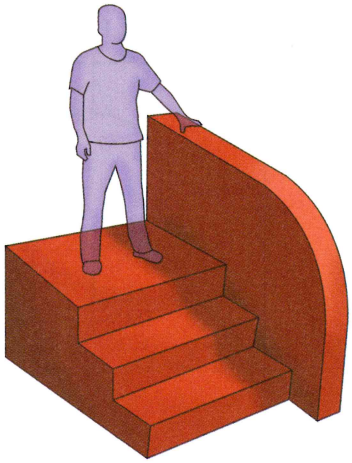


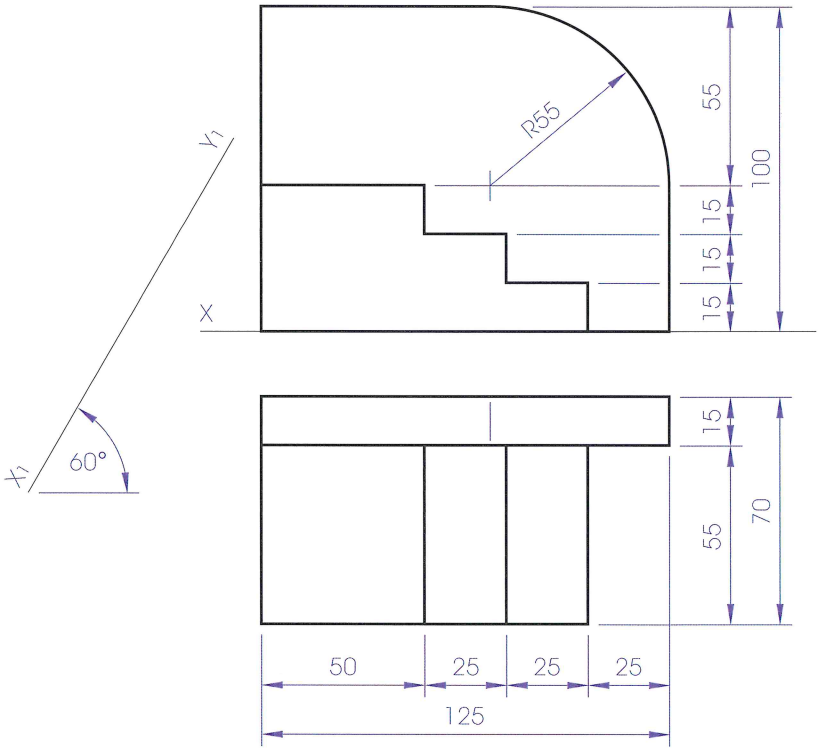


2. The elevation and plan of a **flight of steps** are shown below.

(a) Draw the given views.

(b) Draw an **auxiliary elevation** of the *entire structure* on the given ground line X_1Y_1.

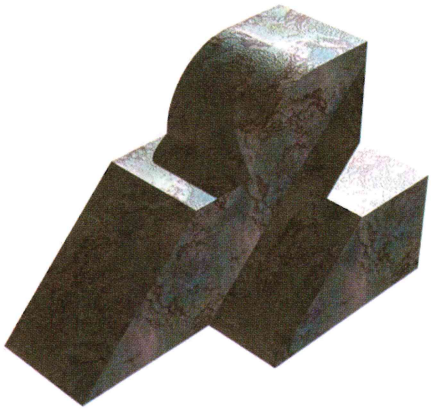


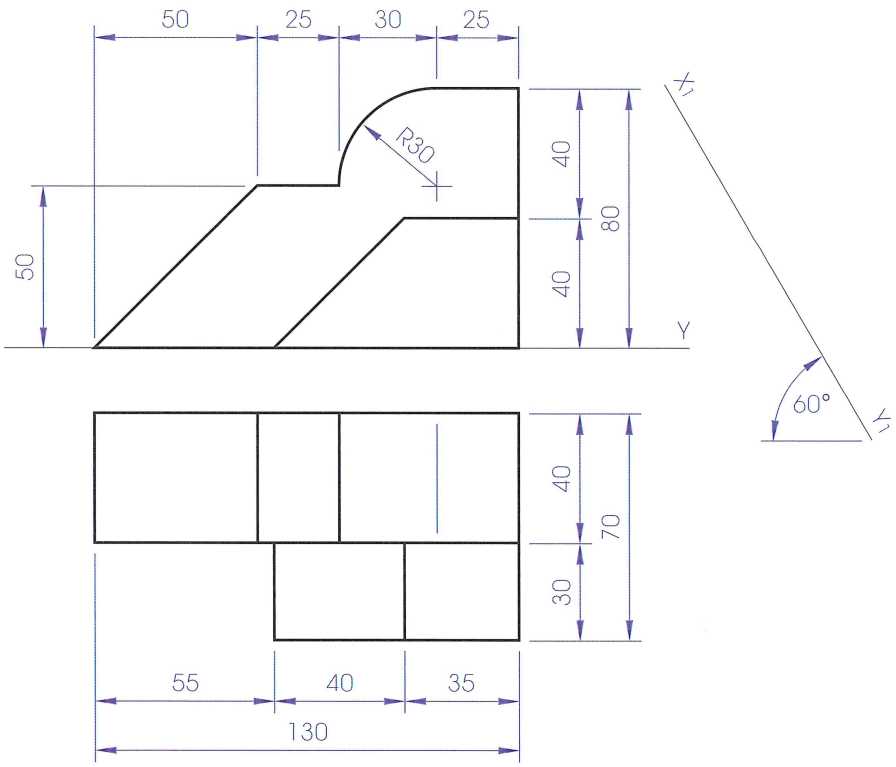


3. The figure below shows the elevation and plan of a **solid**.

(a) Draw the elevation and plan.

(b) Draw an **auxiliary elevation** of the solid on the given ground line X_1Y_1.

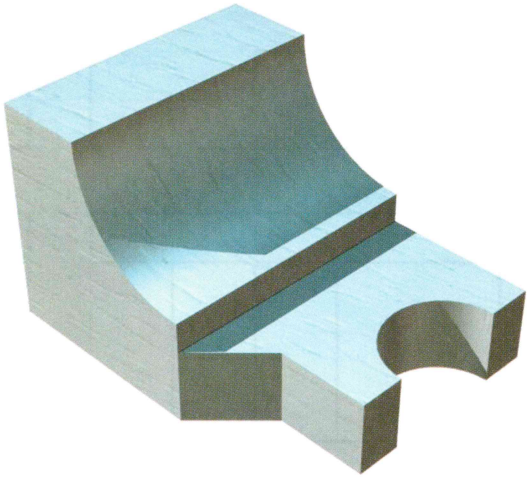


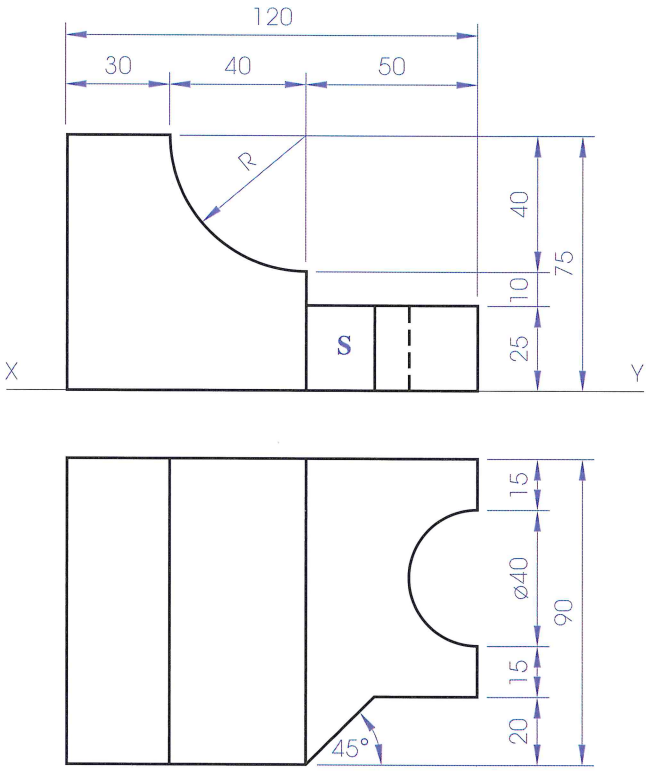


4. The elevation and plan of a **component** are shown across.

(a) Draw the given views.

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



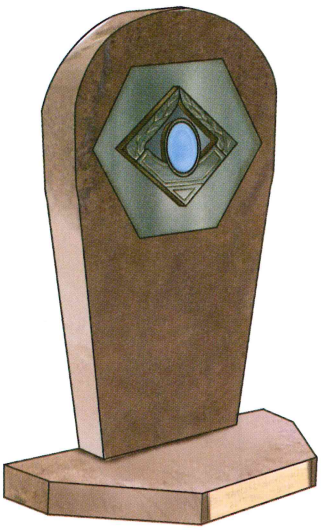


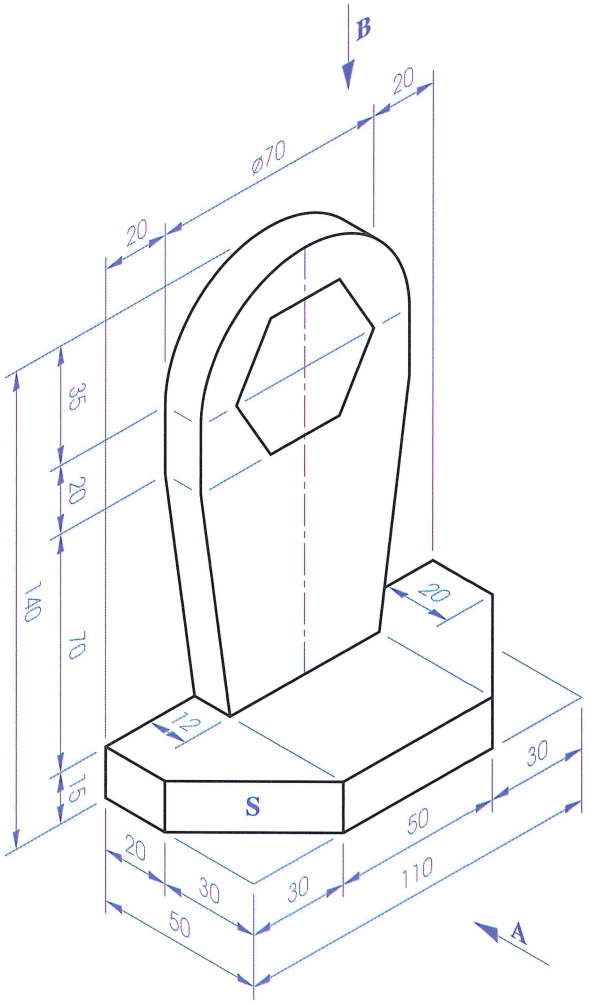
5. The figure over shows a pictorial view of a **trophy**, which contains a **regular hexagon**.

(a) Draw an **elevation** of the trophy looking in the direction of arrow **A**.

(b) Draw a **plan** looking in the direction of arrow **B**, projected from the elevation.

(c) Draw an **auxiliary elevation** of the trophy, which will show the true shape of the surface S.





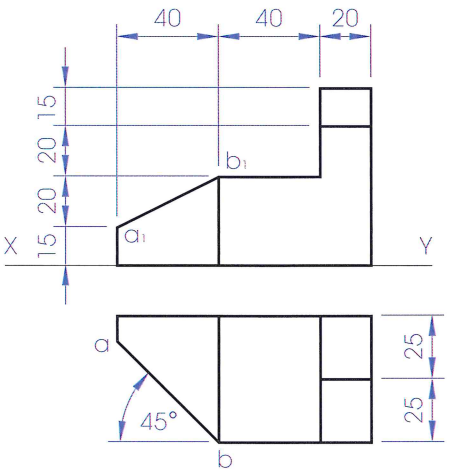
Answer Worksheets 18C and 18D

True Length using Auxiliary Elevations

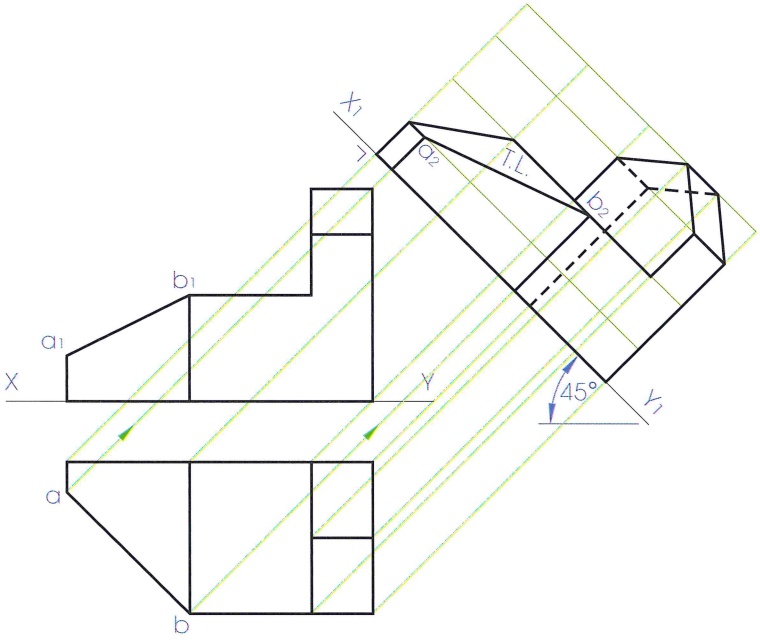
A line will appear in true length in an auxiliary elevation in which the viewing direction is at right angles to the plan of the line.

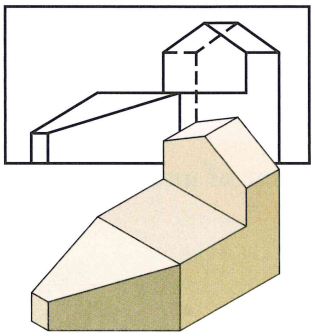
Example

The elevation and plan of a **solid** are shown over. Draw an **auxiliary elevation** of the *entire solid* which will show the true length of the line AB.



1. The true length of the line AB will appear in an auxiliary elevation in which the viewing direction is at right angles to the plan of the line AB, as illustrated below, right. Accordingly, draw the X_1Y_1 line parallel to the plan of the line AB and project the auxiliary elevation as shown below, left.



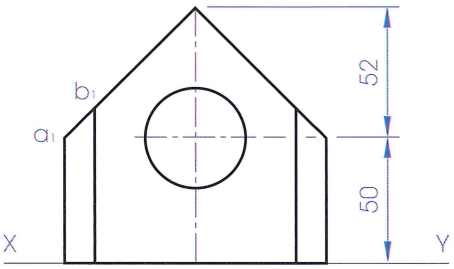


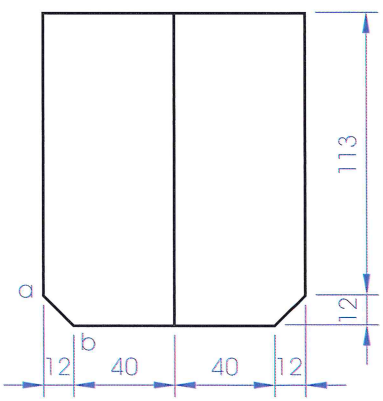
Exercise

The elevation and plan of a **birdhouse** are shown over.

(a) Draw the given views.

(b) Draw an **auxiliary elevation** of the birdhouse which will show the true length of the line AB.





Answer Worksheet 18E