Developments 2
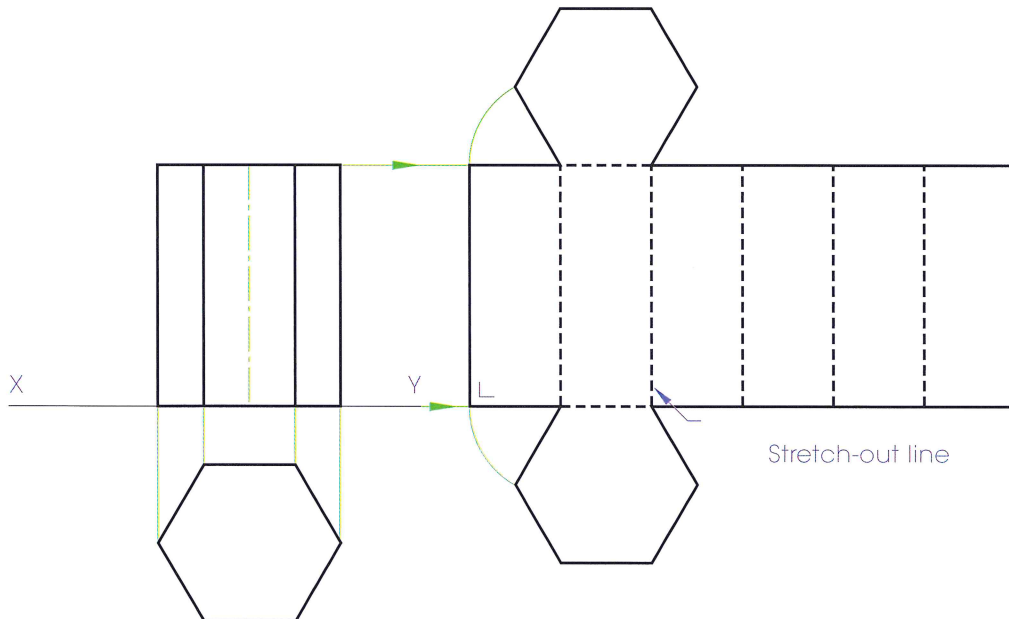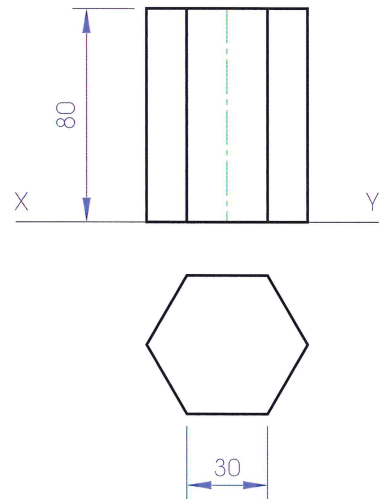
Parallel-line Developments

In chapter 10 we considered developments of a range of objects. We saw that:

Every face or surface in a development represents the true shape of that face or surface of the object.

Example 1

1. The elevation and plan of a **regular hexagonal prism** are shown over.
   (a) Draw the given views.
   (b) Draw a complete **development** of the prism.

1. The plan and elevation are drawn in the normal manner.

2. The base edges of the prism develop as a straight line which is known as the **stretch-out line**. It will be 6 × 30 = 180 mm long.

3. The lateral edges develop as lines perpendicular to the stretch-out line. It can be seen from the plan that these edges will be 30 mm apart. Their true lengths can be transferred from the elevation, as shown below.

4. The end faces, which appear in true shape in plan, can be redrawn in the development.


The base or end face edges of a prism develop as a straight line known as the **stretch-out line**.
Its lateral edges develop as lines **perpendicular to the stretch-out line**.
The result is known as a **parallel-line development**.

Example 2

1. The elevation and end view of a **box for tennis balls** are shown over.
   (a) Draw the given views.
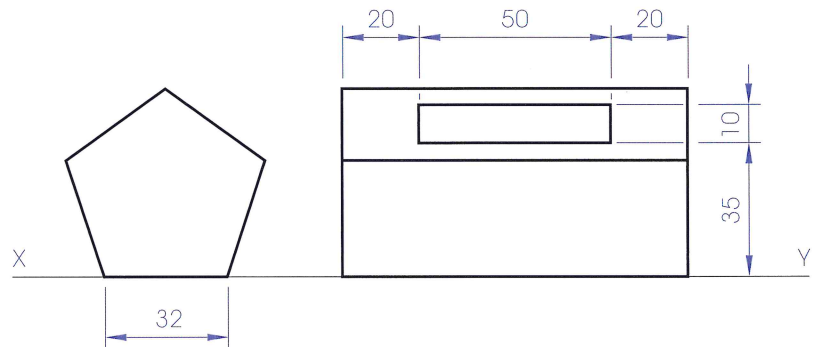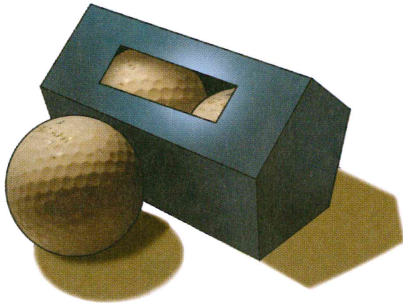   (b) Draw a complete **development** of the box.
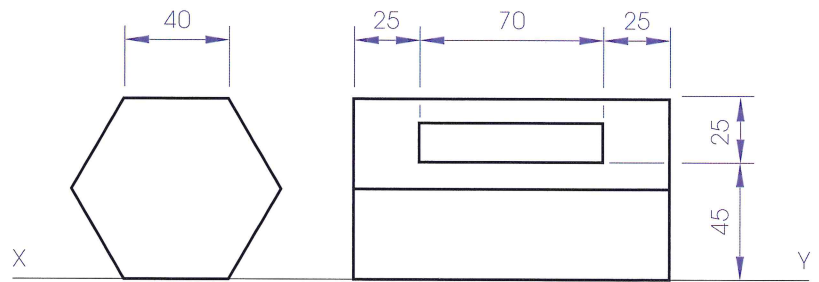
1. The end view and elevation are drawn in the normal manner.

2. In this case the stretch-out line will be
   $6 \times 40 = 240$ mm long
   and can be drawn as shown below.

3. The lateral edges will be perpendicular to the stretch-out line and 40 mm apart. Their true lengths can be transferred from the elevation.

4. The true length and width of the opening can be transferred from the elevation and end view respectively, allowing the development to be completed as shown.

Stretch-out line
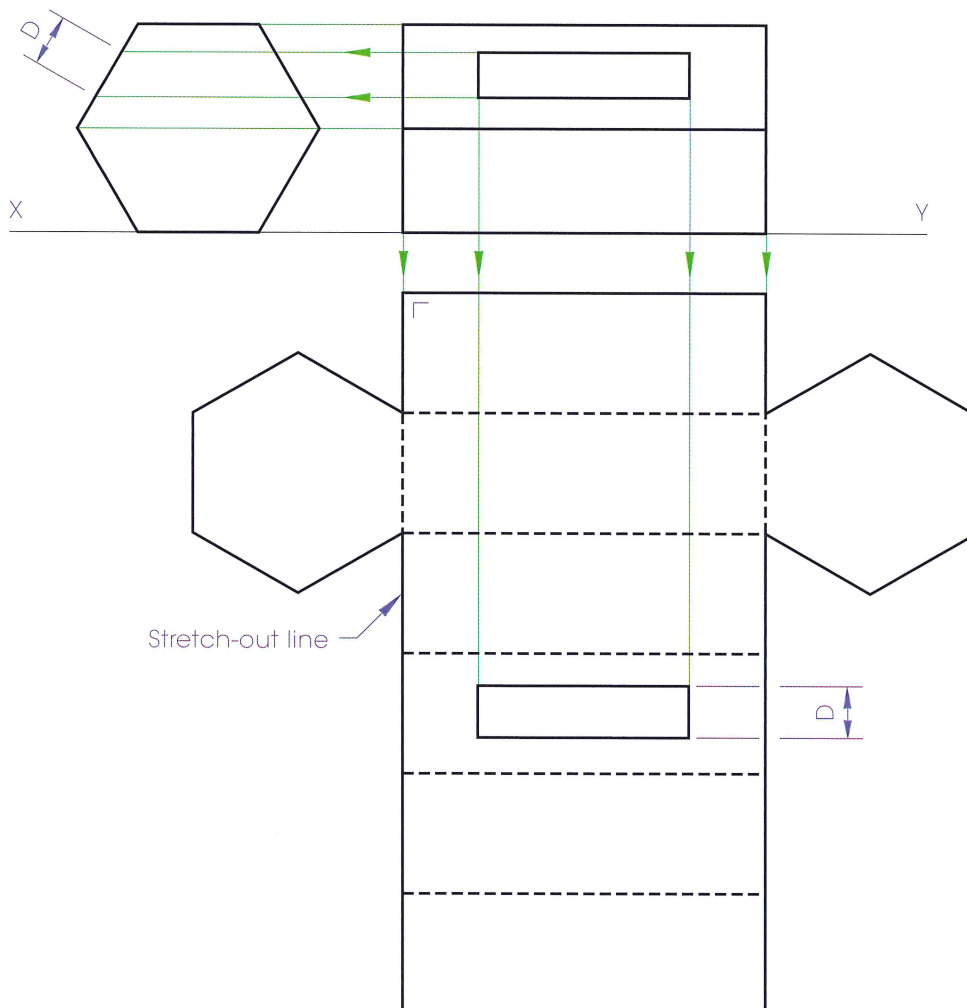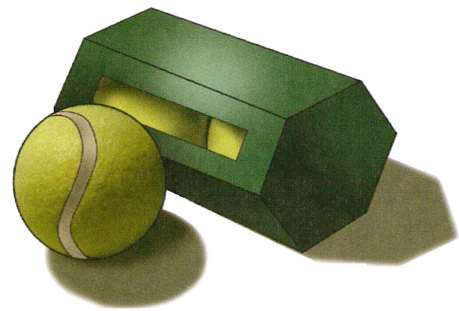
Exercise

The elevation and end view of a package for **two golf balls** are shown below. The box is based on a **regular pentagonal prism.**
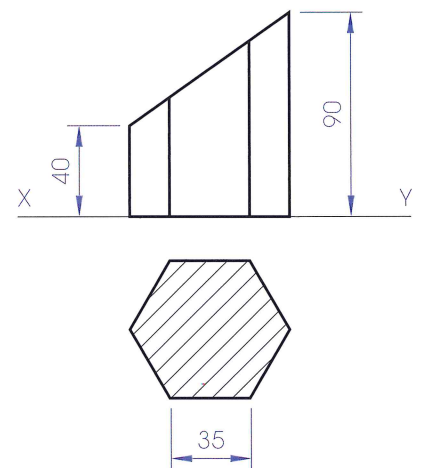
(a) Draw the given views.

(b) Draw a complete **development** of the box.

Example

The figure over shows the elevation and plan of a **truncated regular hexagonal prism**.

(a) Draw the given views.

(b) Determine the **true shape** of the cut section of the solid.

(c) Draw a complete **development** of the truncated prism.

1. The given views and the true shape of the cut section are drawn as shown below (refer to page 222).

2. The stretch-out line will be 210 mm long.

3. The lateral edges will be perpendicular to the stretch-out line and 35 mm apart. Their true lengths can be transferred from the elevation as shown over.

4. The development can be completed by redrawing the base (which appears in true shape in plan) and the true shape of the cut section of the solid.
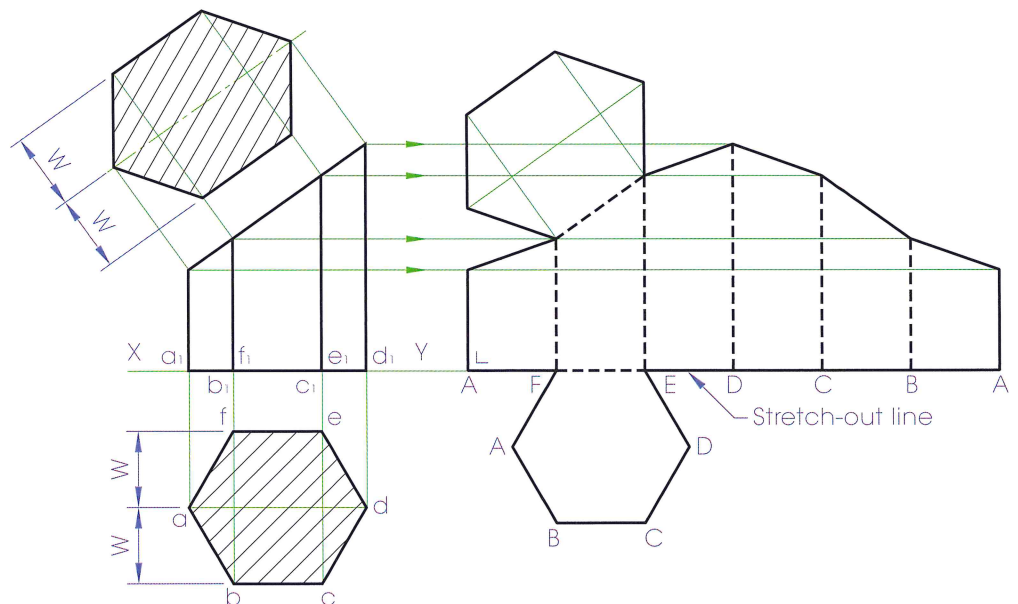
The seam is normally at the shortest lateral edge.