Shade and Shadow

Many sketches need no shading yet all sketches may be shaded. The amount of effort put into shading depends on the purpose of the sketch, the subject being drawn, the type of drawing and the need for clarity. Most sketches are more pleasing to the eye if surfaces are emphasised and contrasts are indicated. By using shading and shadow to differentiate between vertical, horizontal and inclined surfaces the drawing becomes easier to read. Pictorial sketches are regularly shaded but orthographic or working drawings are usually left unshaded.

There is one guiding principle in shading or rendering a drawing. The rendering must always make the drawing either clearer or more attractive. If it fails in these it is better to omit it. Rendering should not be used to hide inaccuracy or mistakes. It can only be successful if the basic drawing is correct.

Terminology

We must first define what we mean by shade and shadow because they are not two words for the same thing.

Shadow

A shadow is a relatively dark figure, cast by an opaque object or part of an opaque object, onto a surface. It is caused by the object intercepting or blocking the light rays from a source.
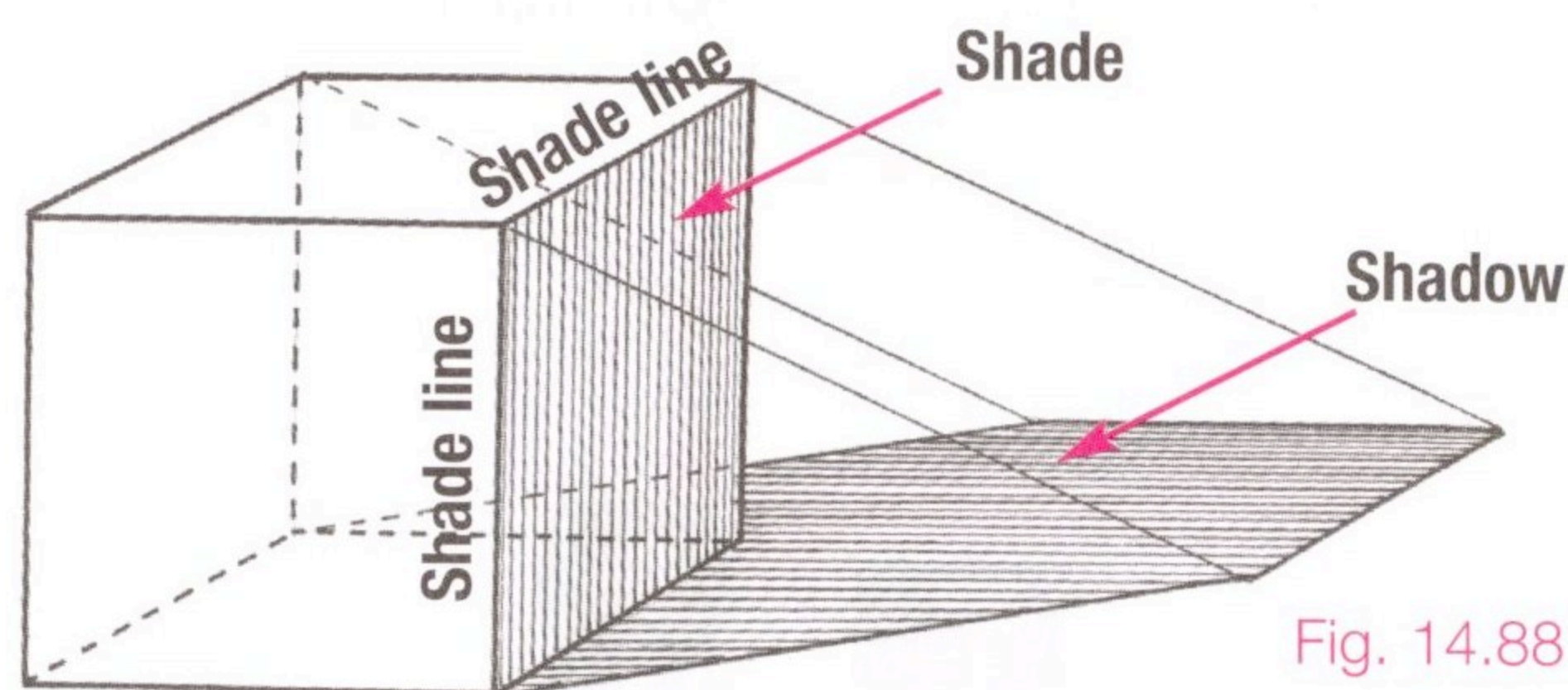

Fig. 14.88

Shade

Shade refers to the varying amount of light that is reflected to an observer by the surfaces of an object. Shade will be at its darkest on areas turned away from the light and will vary in brightness as a surface turns toward the light, Fig. 14.88.

Shade line

A line on an object that separates an illuminated surface from one in shade. Also called the casting line.

Shadow line

The edge of the shadow cast on a receiving body.

Surfaces are shaded and shadows are cast.

Shadow of a line

(1)   When a vertical line casts a shadow onto a horizontal surface the shadow will be in the direction of the shining light rays.

(2)   If the line intersects the surface then the shadow starts where the line and surface meet.

(3)   A straight line will cast a straight shadow onto a plane surface.

(4)   A straight line will produce a shadow plane, Fig. 14.89. This is a plane produced by the shadows of adjacent points on the line. The intersection of the shadow plane with another surface produces a shadow.
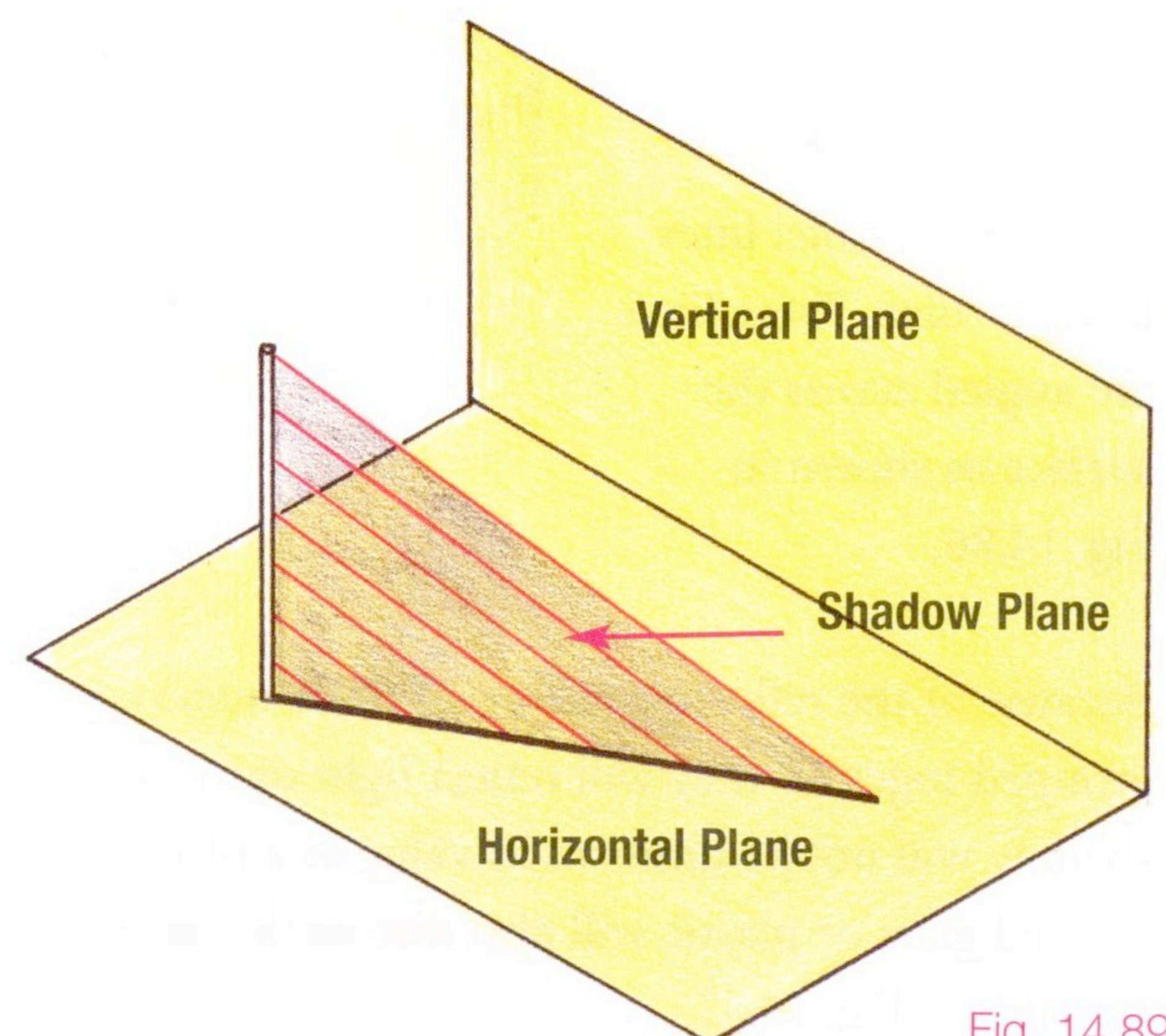

Fig. 14.89

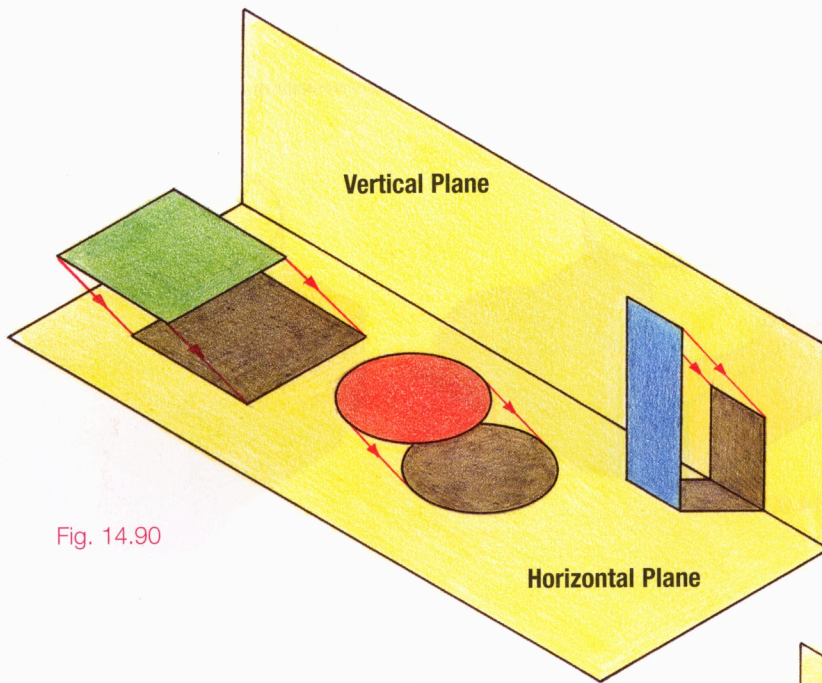The hypotenuse of this shadow plane establishes the direction of the light rays.

Vertical Plane

Horizontal Plane

Fig. 14.90

Shadows of plane figures

(1) A plane figure will cast a shadow identical to itself in both size and shape onto a parallel plane (assuming parallel light rays).

(2) The shadow of parallel lines are parallel when they fall on the same plane.

(3) A shadow line changes direction when it crosses a corner or edge between two surfaces, Fig. 14.90.

Shadow of solids

(1) The shadow of a solid is outlined by the shadows of the shade lines of the solid.

(2) The shadow cast by a complex group of objects is a composite of the shadows of its simplest geometric components.

(3) Every part of an object that is in light must cast a shadow.
The opposite to this holds true. Any point not in light cannot cast a shadow because light does not strike it.

(4) A shadow is visible only when there is an illuminated surface to receive the shadow. A shadow can never be cast on a surface in shade, nor can it exist within another shadow, Fig. 14.91.
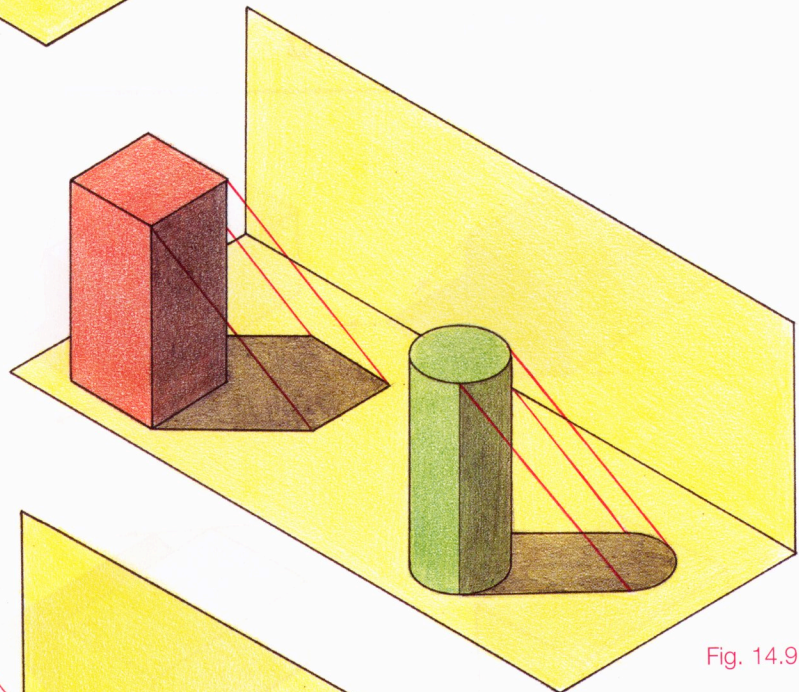
Fig. 14.91a
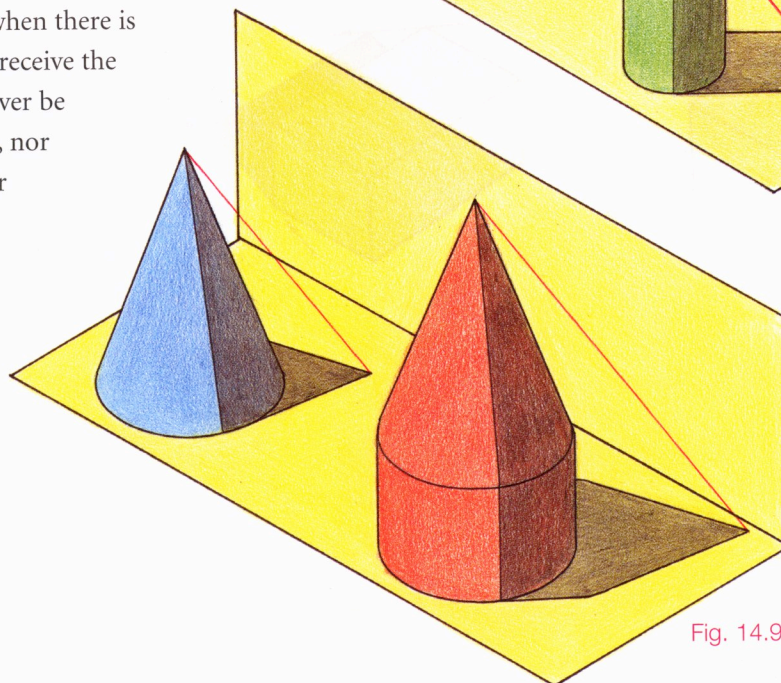
Fig. 14.91b

Light Source

As has been mentioned earlier, for most sketching we assume that the light rays shining on the object are parallel, i.e. the source of light is very far away, e.g. the sun. This makes the working out of the shadow simpler than if the rays are non-parallel. The light source can be anywhere, behind, above, in front, to the left, below etc. The position of the light source will effect the shade and the shadow, see Fig. 14.92.
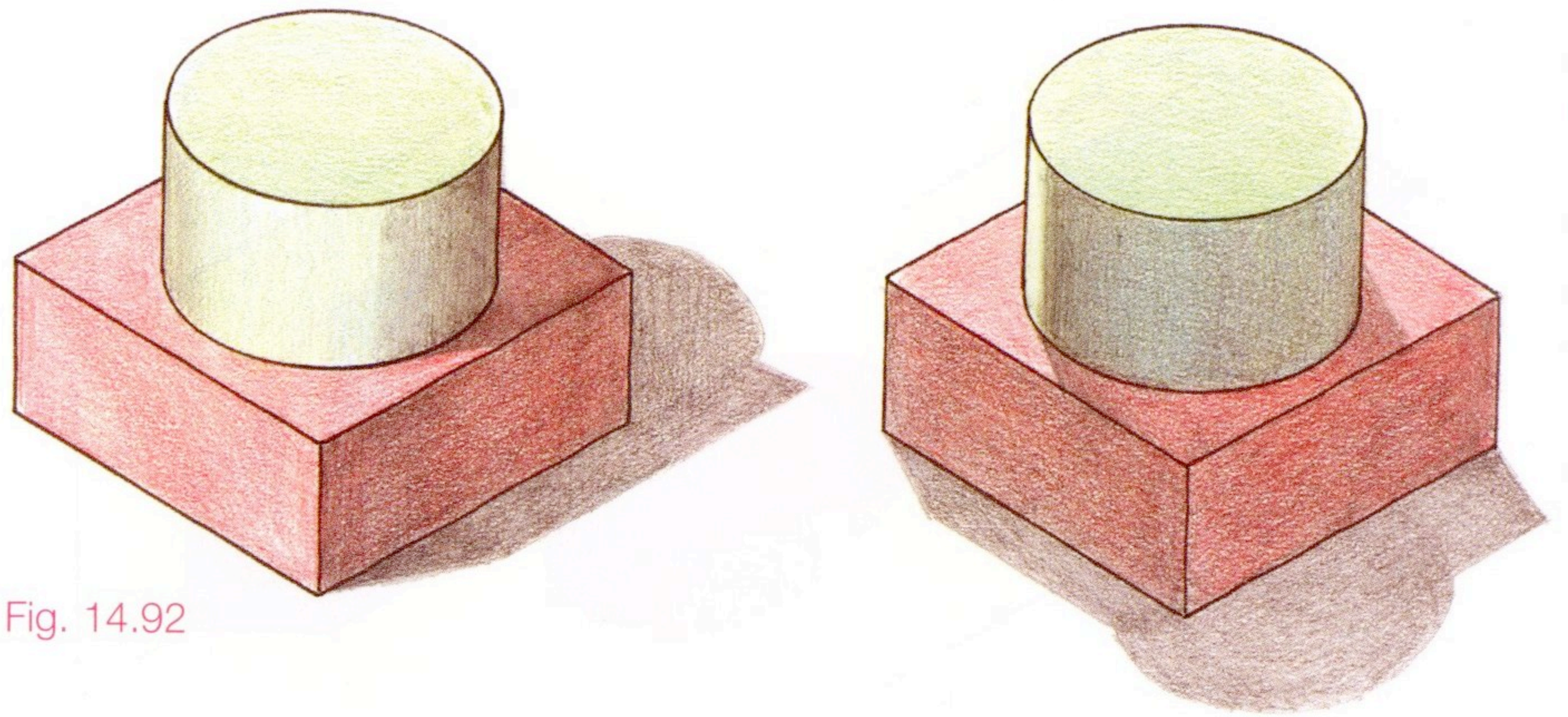
Fig. 14.92

Worked Examples
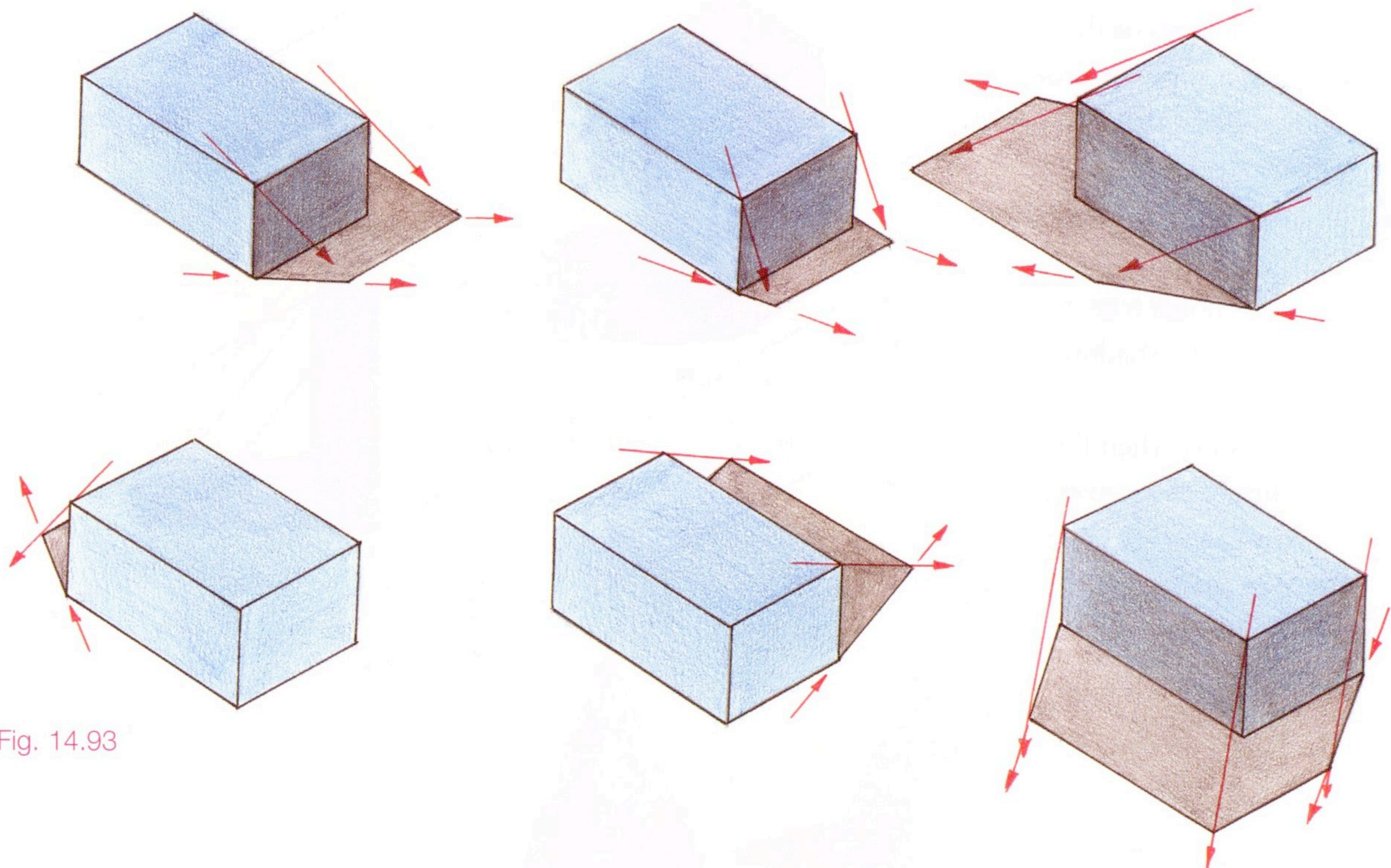
Fig. 14.93

More Worked Examples
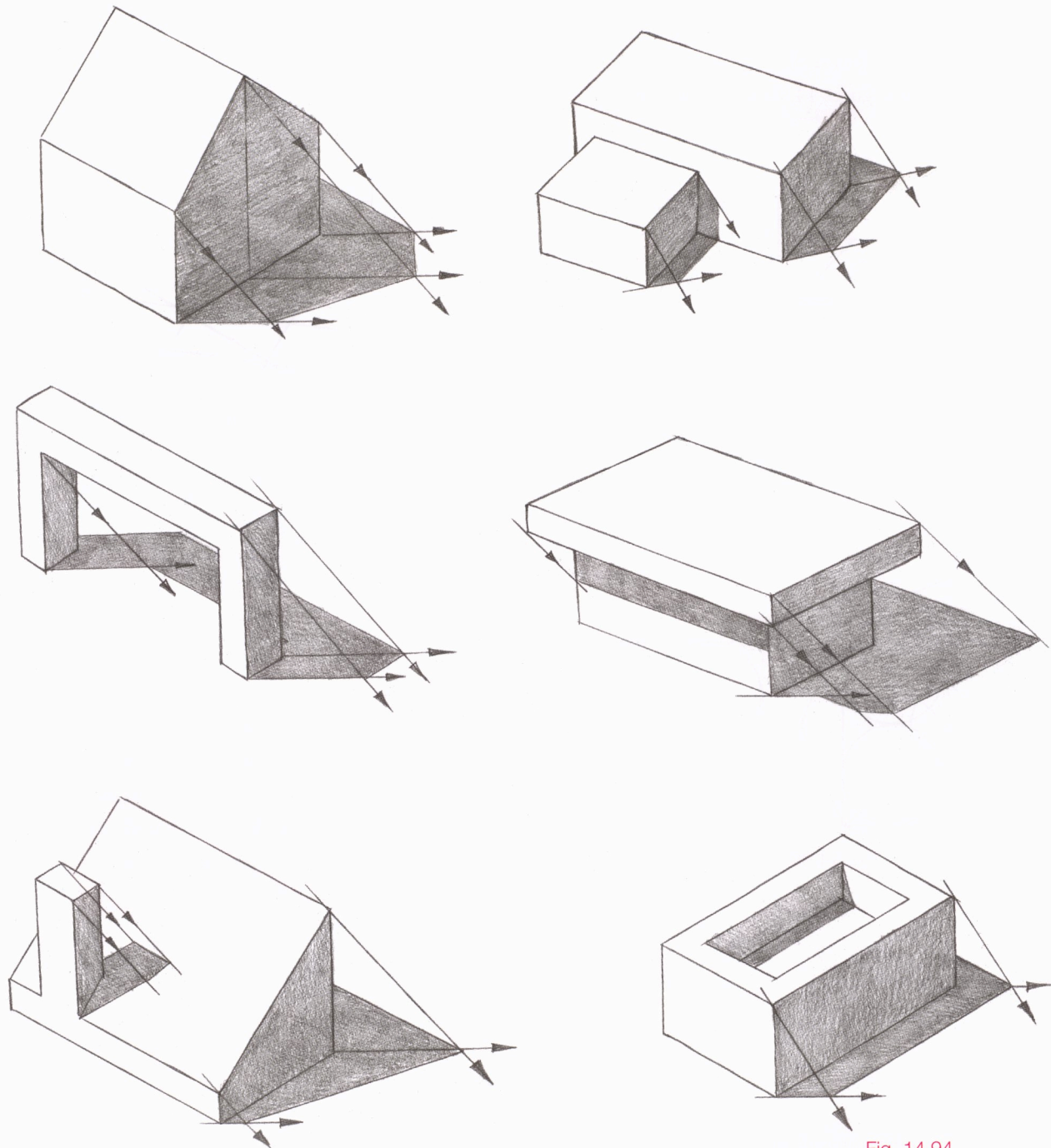
Fig. 14.94

Activities

Q1. Make neat freehand sketches of the plane figures shown in Figures 14.95, 14.96 and 14.97.
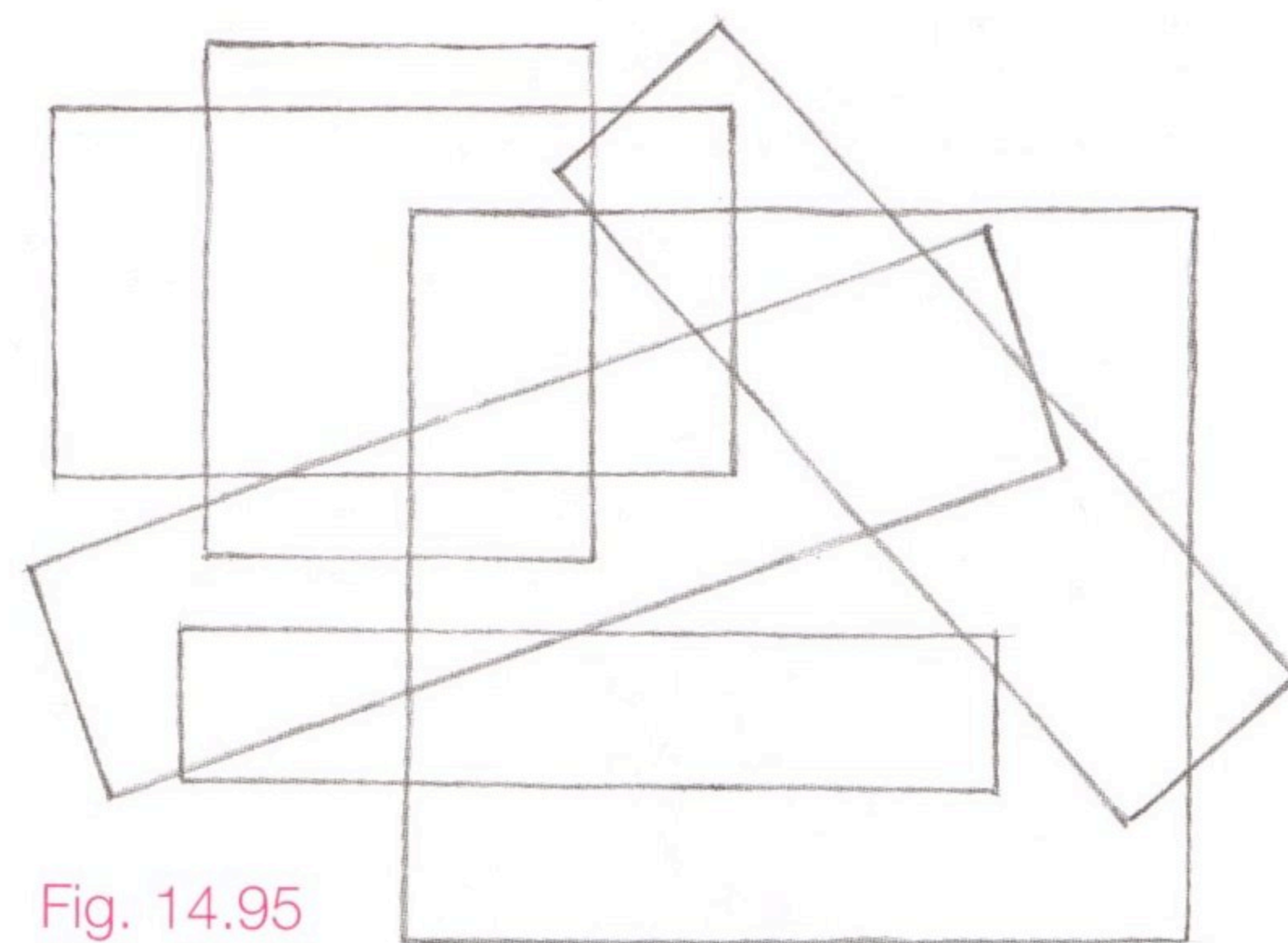
Fig. 14.95
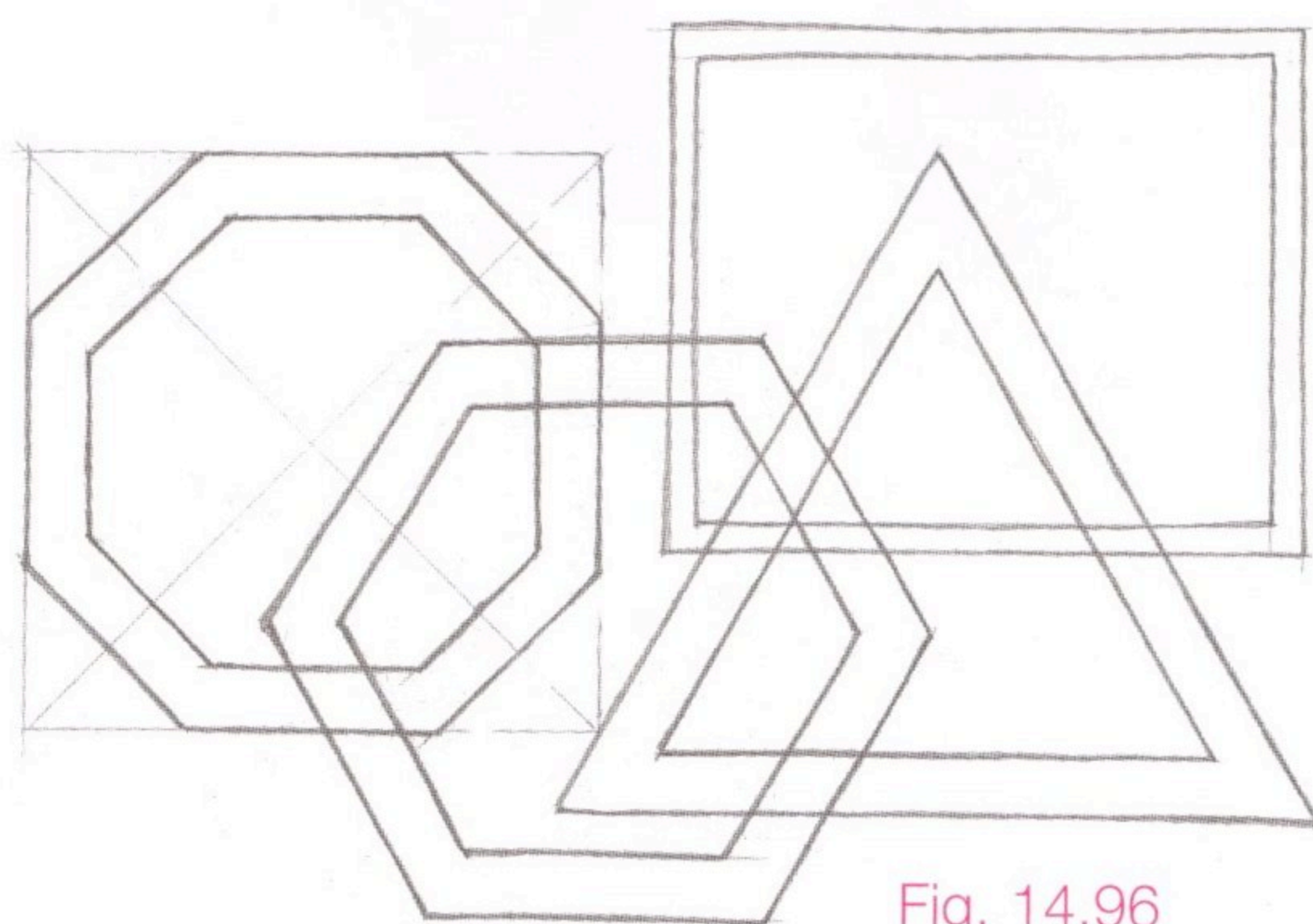
Fig. 14.96
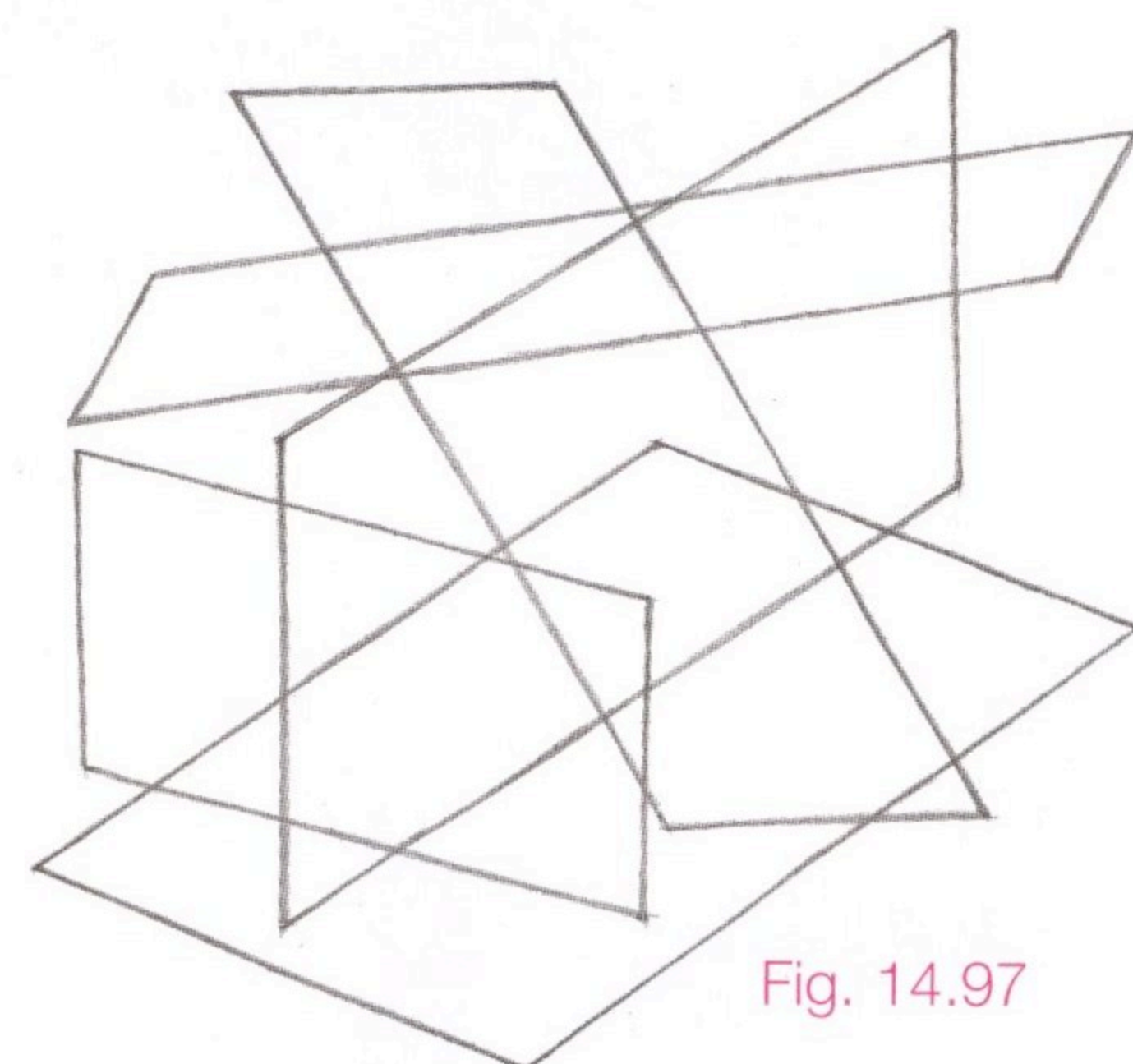
Fig. 14.97
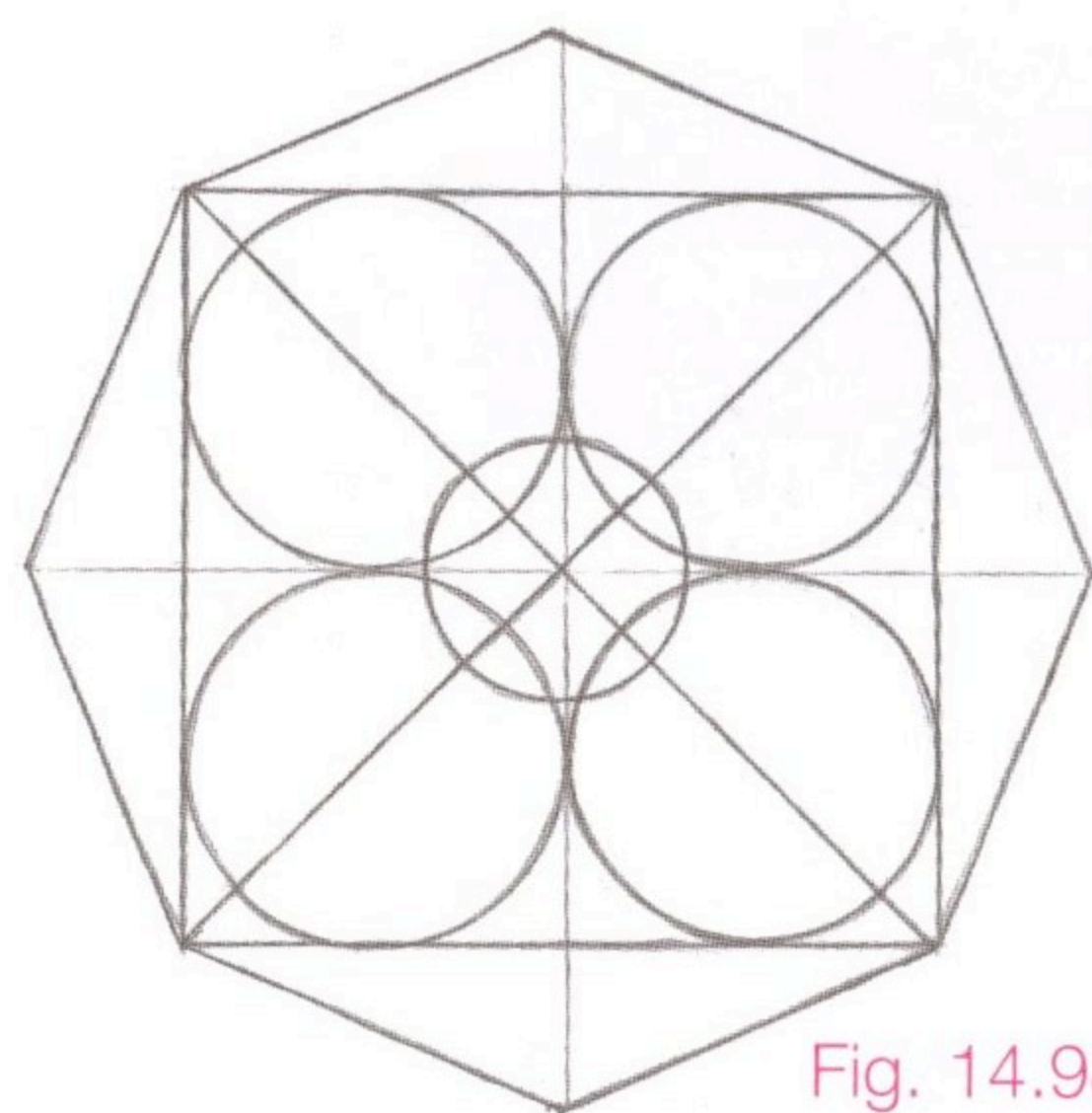
Fig. 14.99
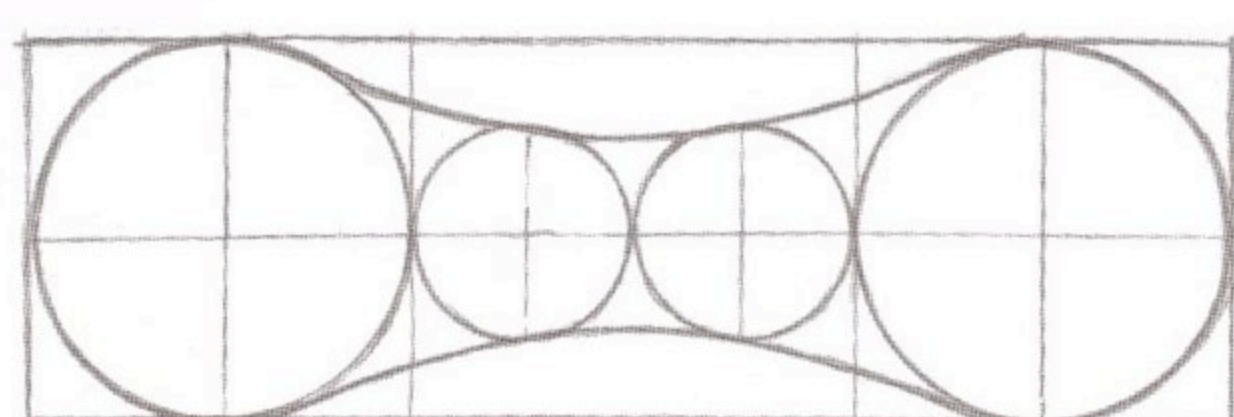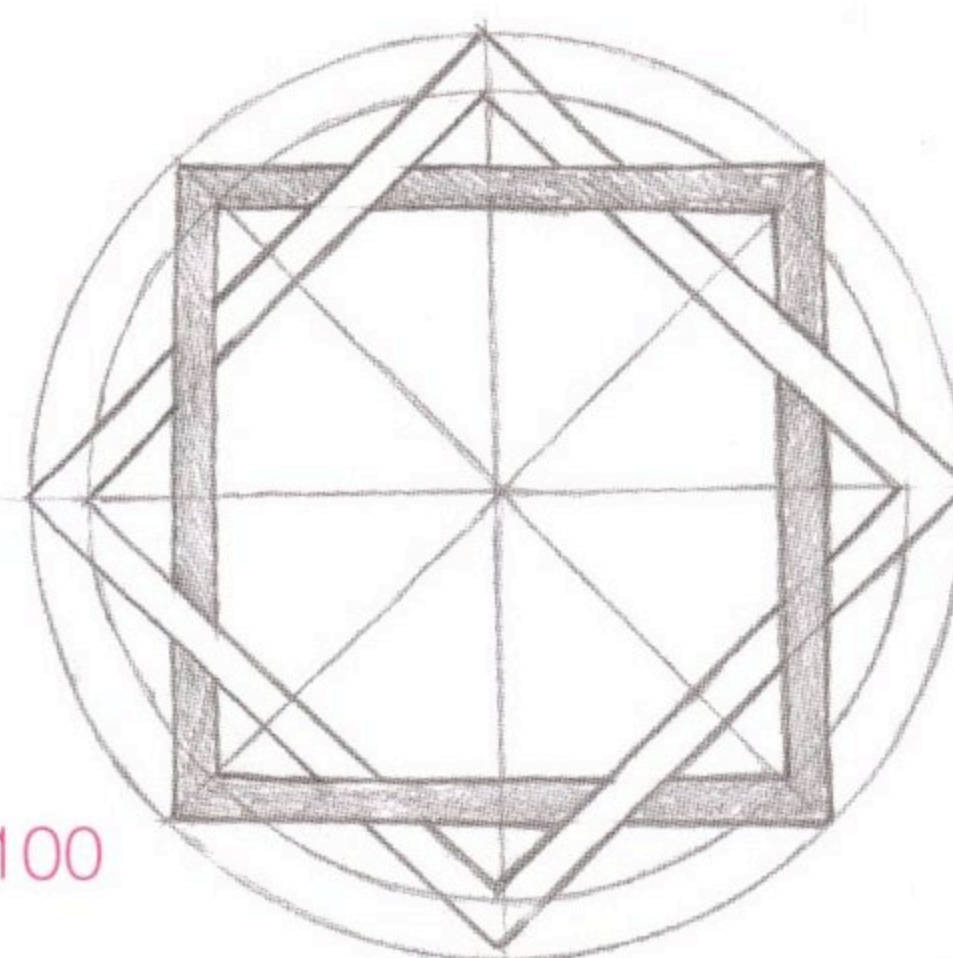
Fig. 14.98

Fig. 14.100

Q2. Sketch the diagrams shown in Figures 14.98, 14.99 and 14.100 which are based on circles.

Q3. Make neat diagrams of the objects shown in Figures 14.101 and 14.102 which are based on ellipses.
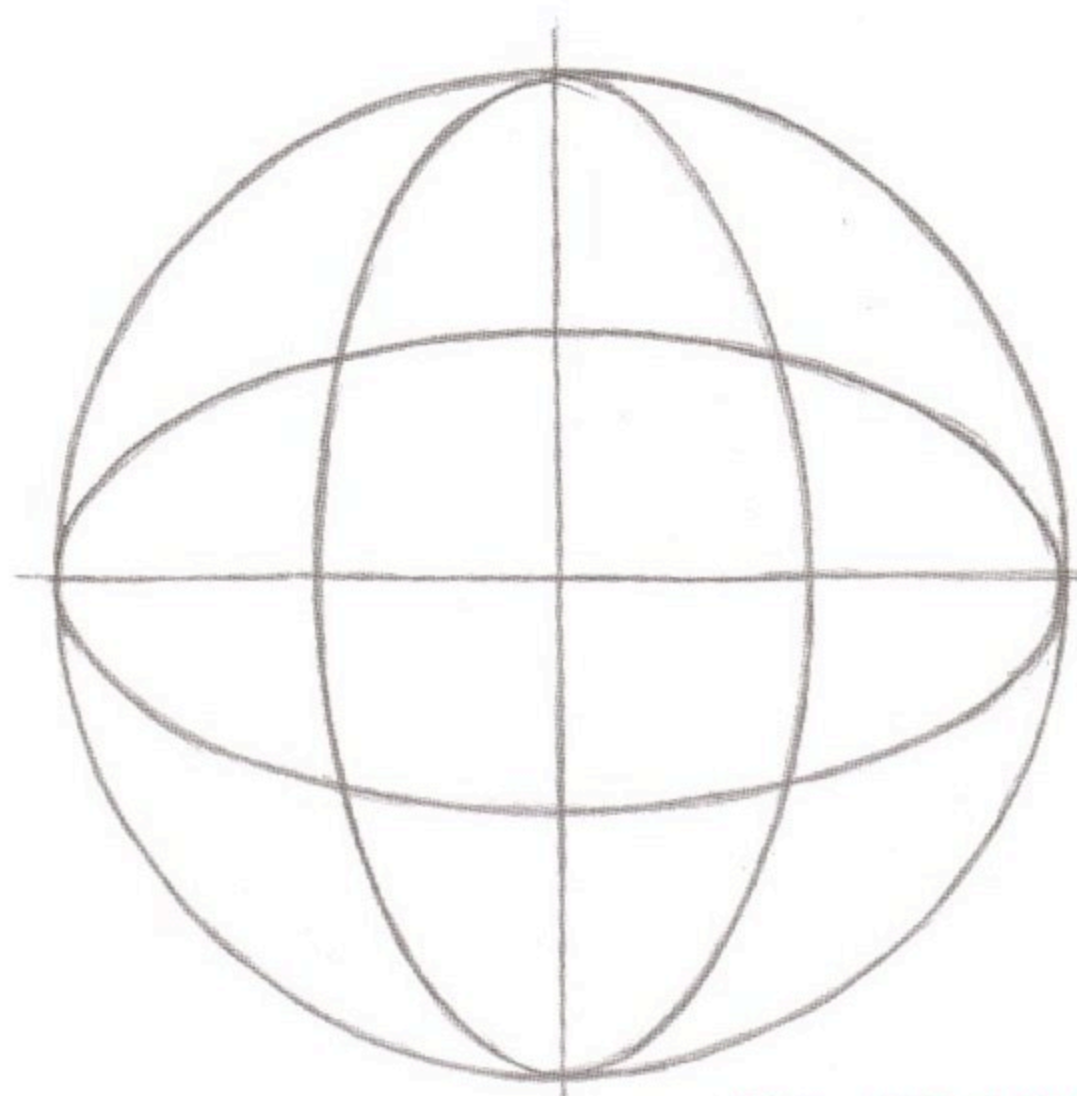
Fig. 14.101
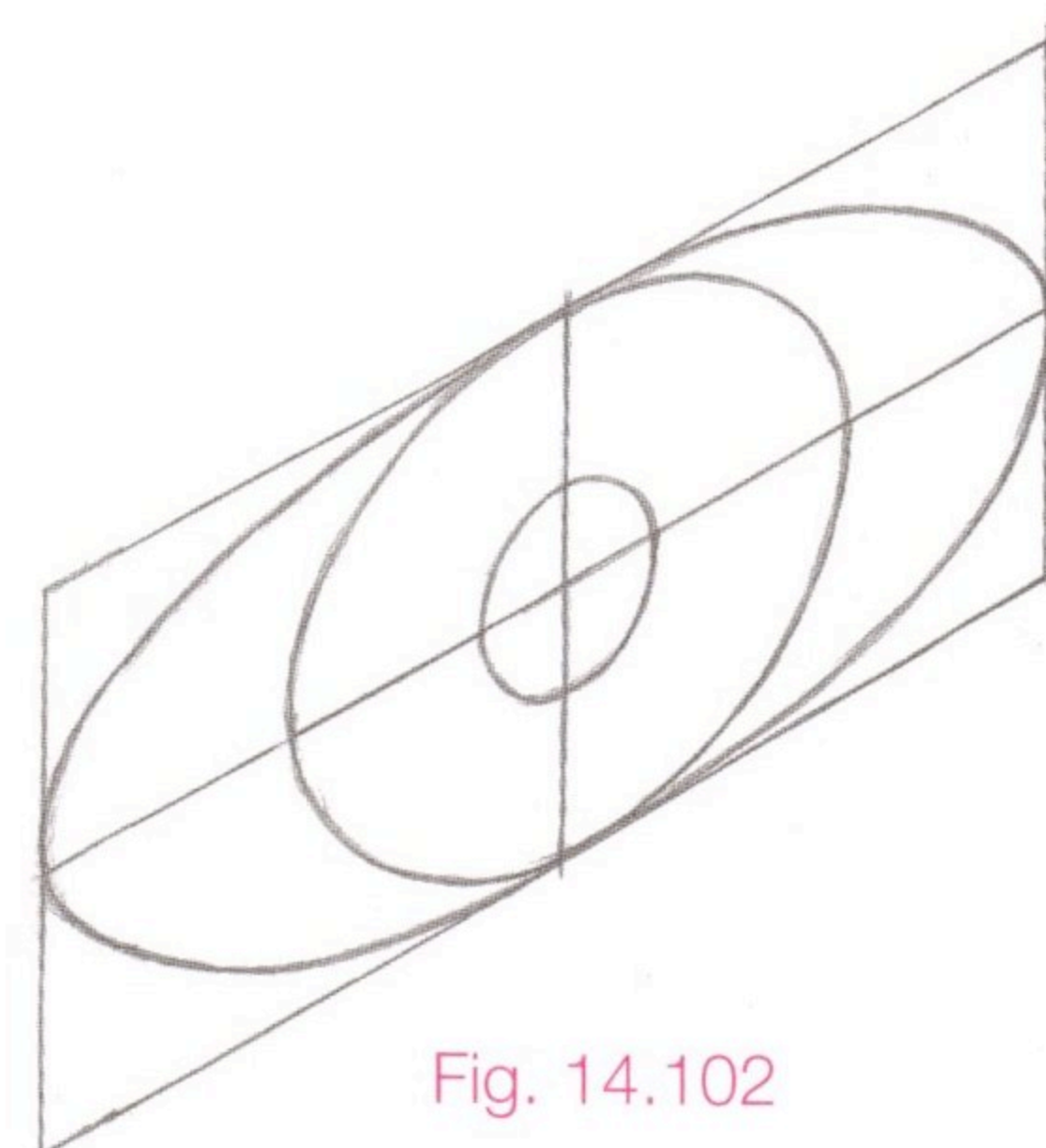
Fig. 14.102

Q4. Given the front elevation, end elevation and plan of an object in Figures 14.103, 14.104, 14.105 and 14.106. In each case make a neat, freehand, pictorial sketch of the object.

Front Elevation   End Elevation

Plan

Fig. 14.103

Front Elevation   End Elevation

Plan

Fig. 14.104

Front Elevation   End Elevation

Plan

Fig. 14.105

Front Elevation   End Elevation

Plan

Fig. 14.106

Front Elevation   End Elevation

Plan
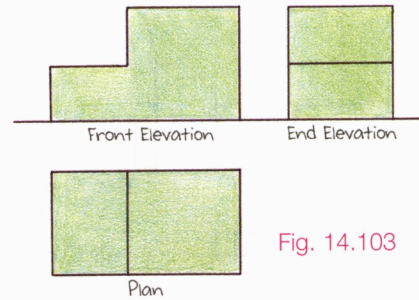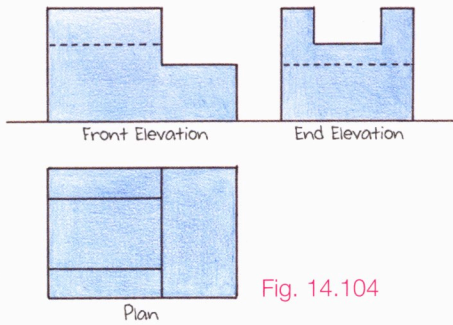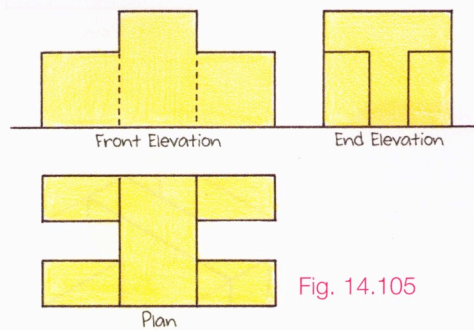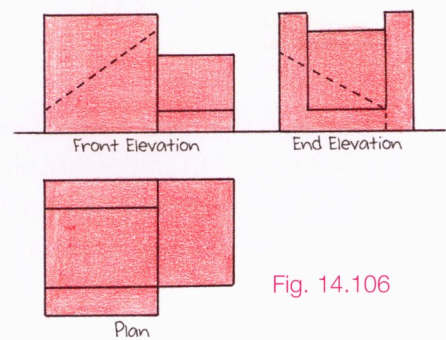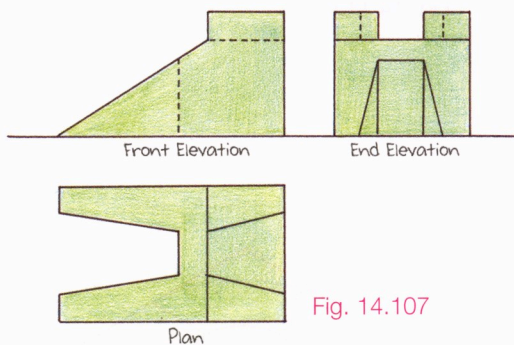
Fig. 14.107

Q5. Given the orthographic views of objects in Figures 14.107 to 14.112. Make neat freehand pictorial sketches of each object.

Front Elevation   End Elevation

Plan

Fig. 14.108

Front Elevation   End Elevation

Plan

Fig. 14.109

Front Elevation   End Elevation

Plan

Fig. 14.110

Front Elevation   End Elevation   Elevation
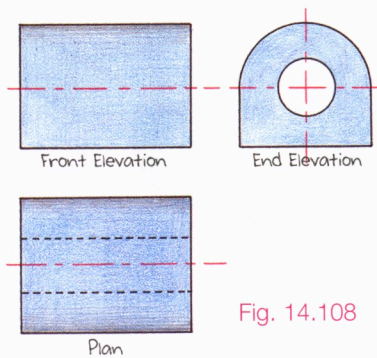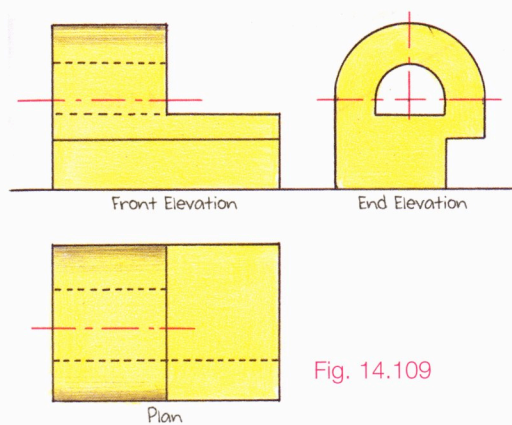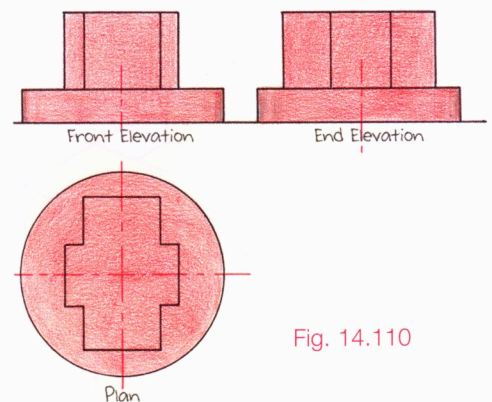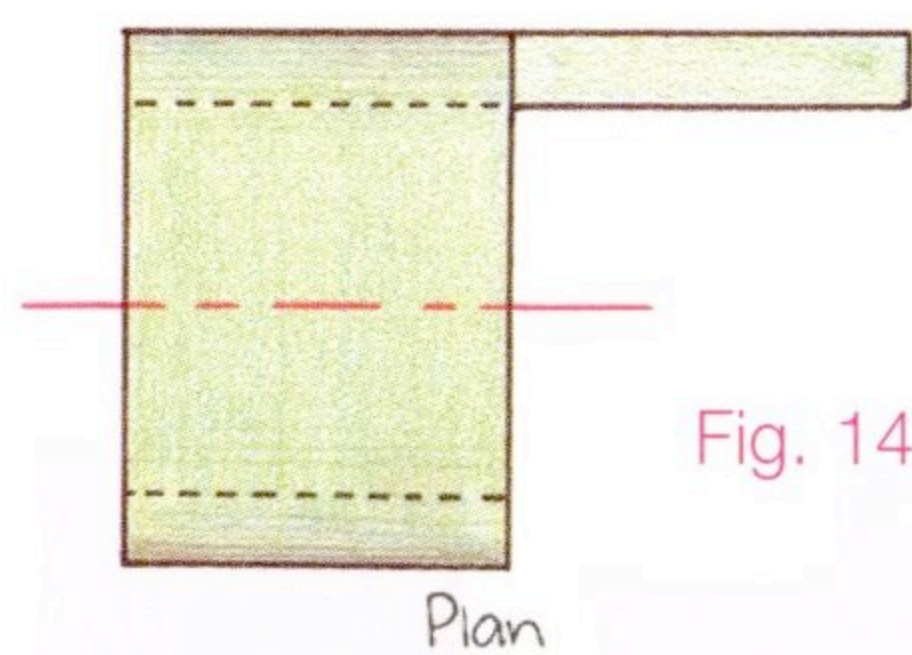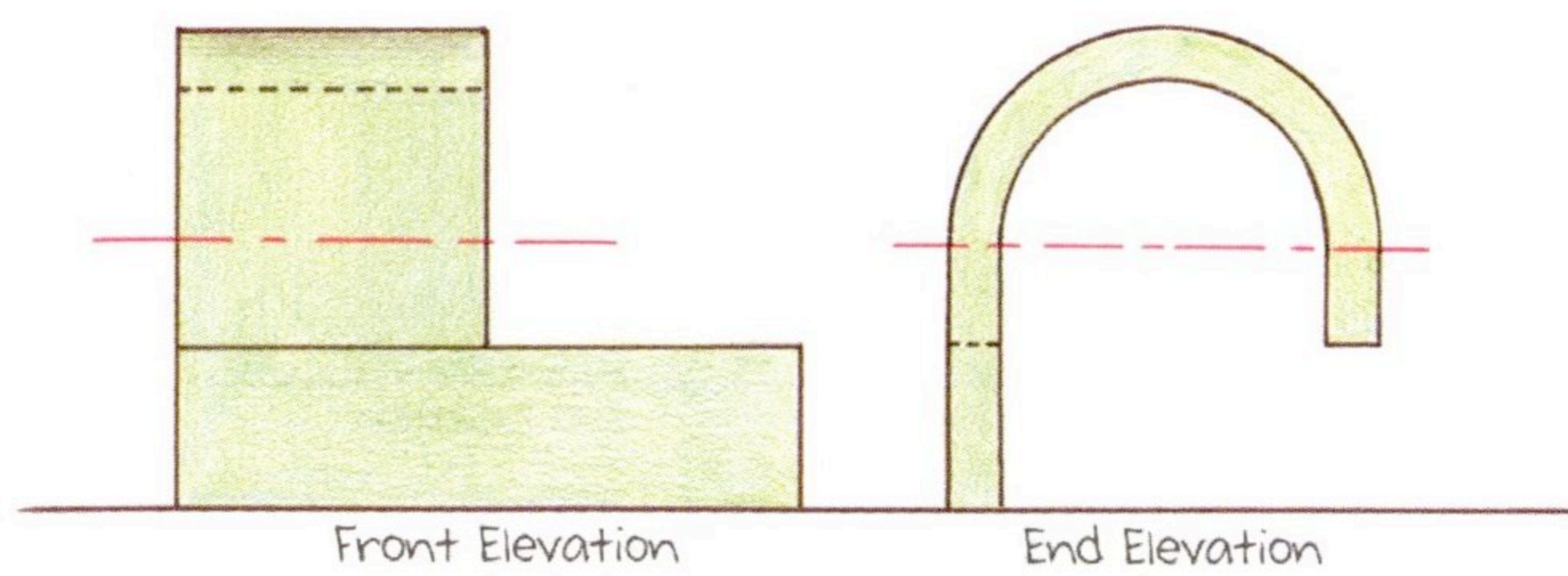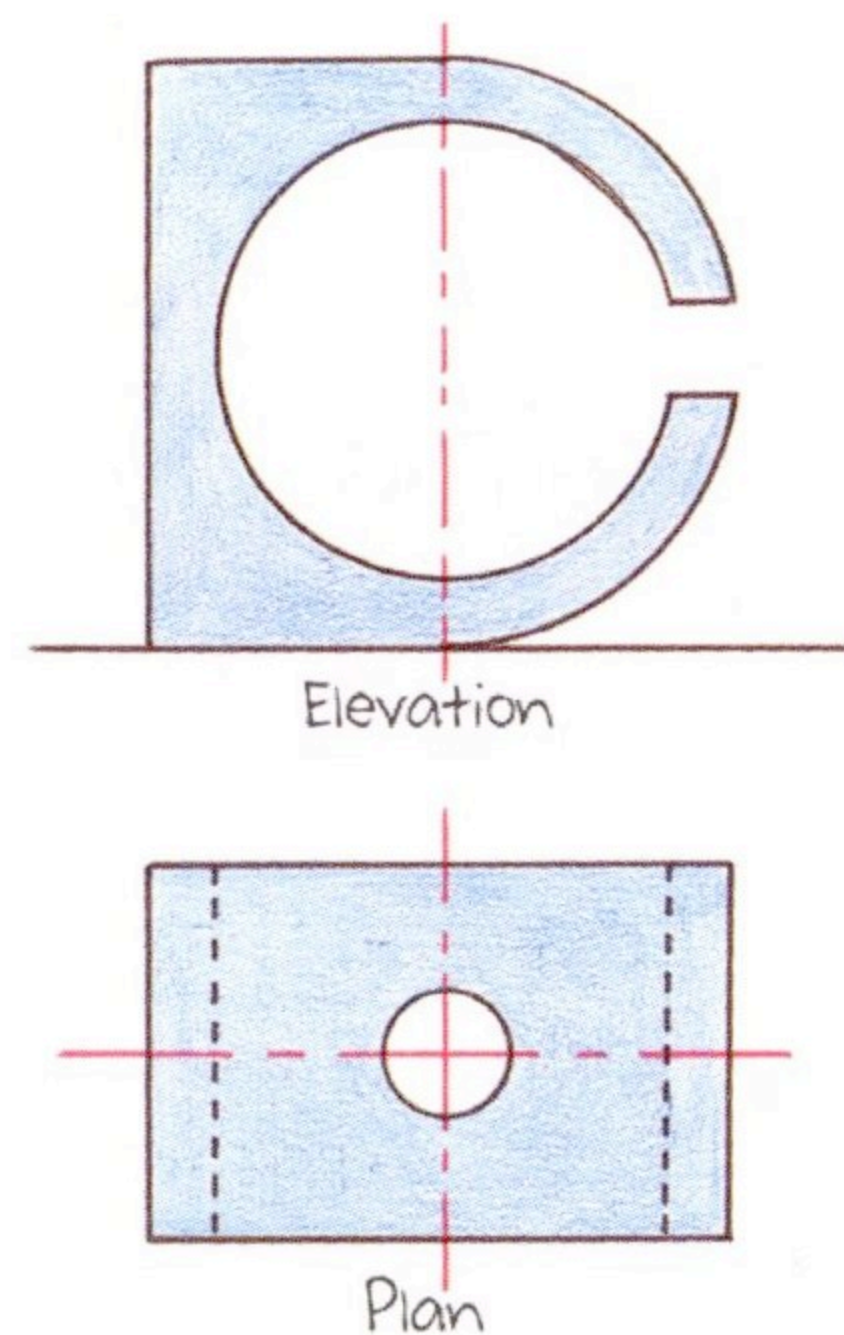
Fig. 14.112

Plan

Plan

Fig. 14.111

Q6. Given a pictorial view of an object, Figures 14.113 to 14.117. For each object make a neat, freehand sketch showing a front elevation, end elevation and plan.
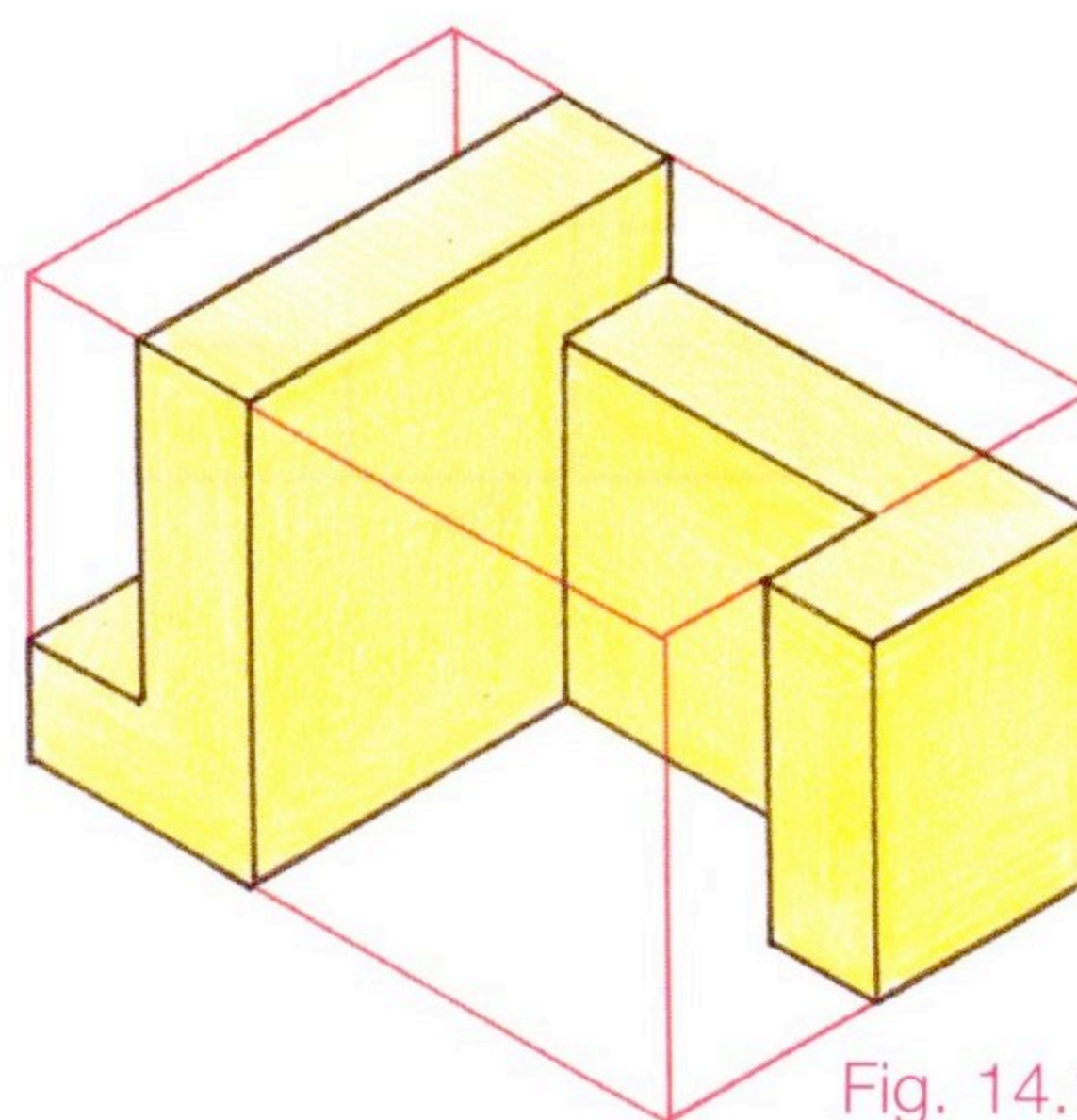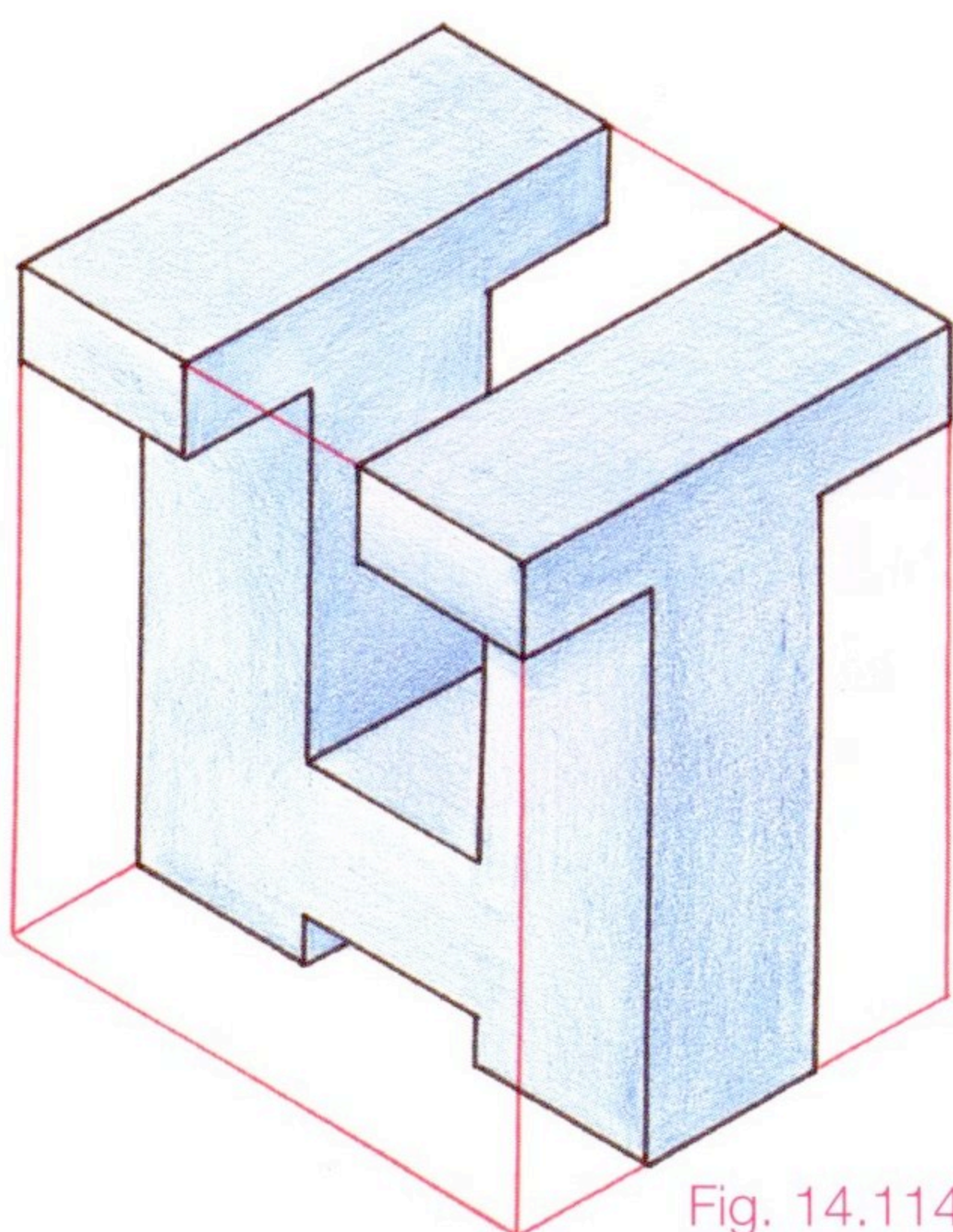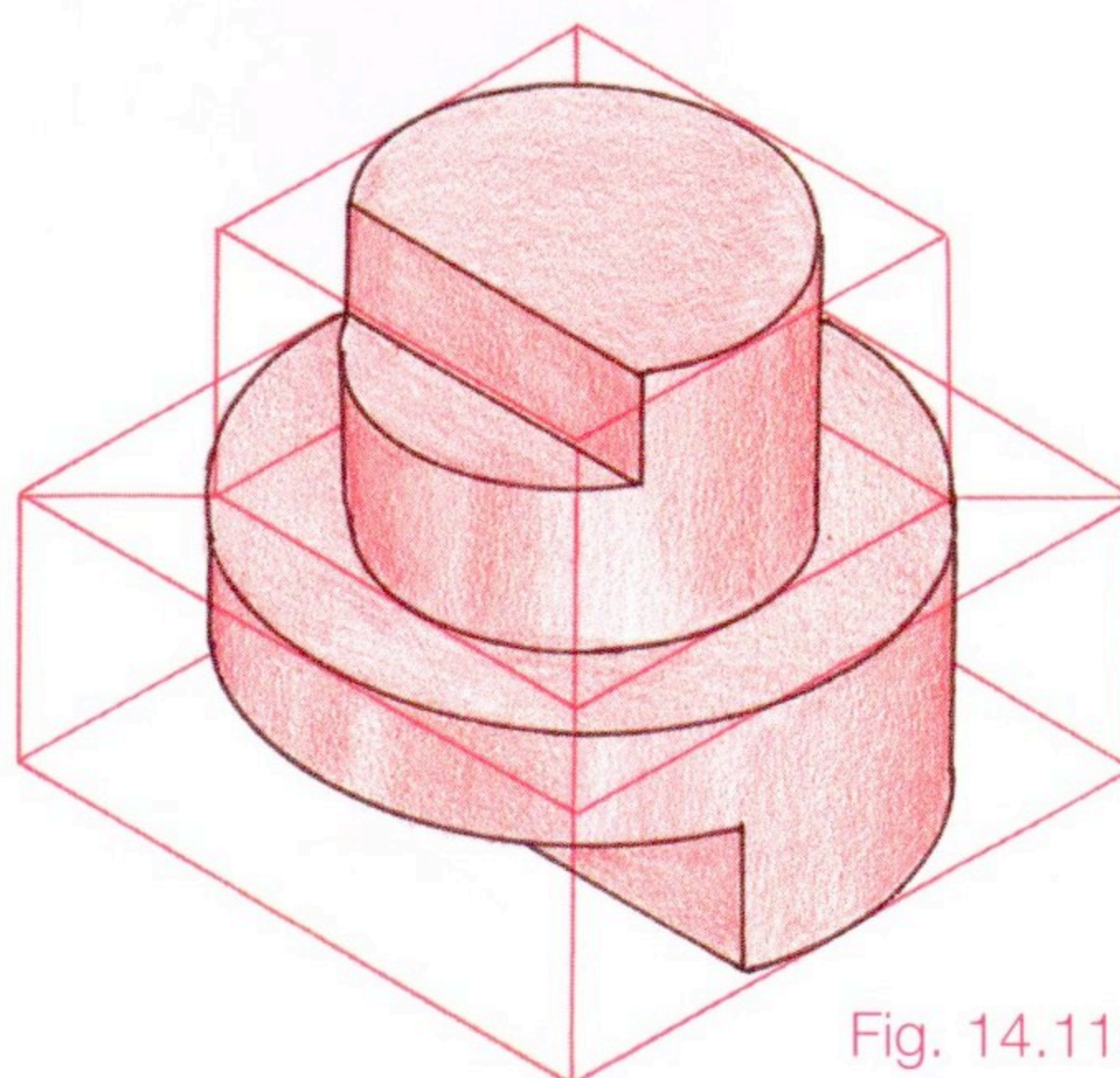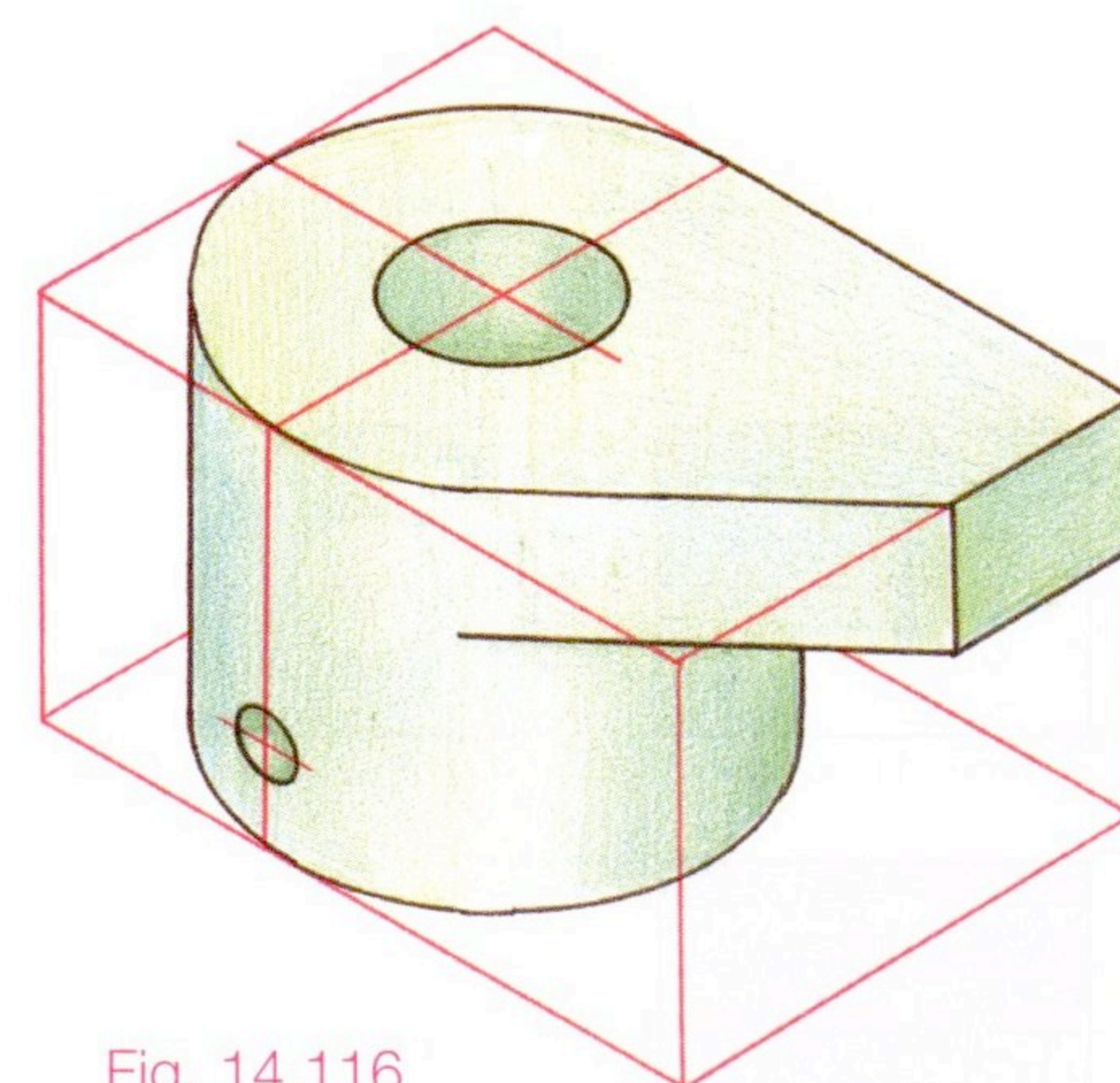
Fig. 14.113

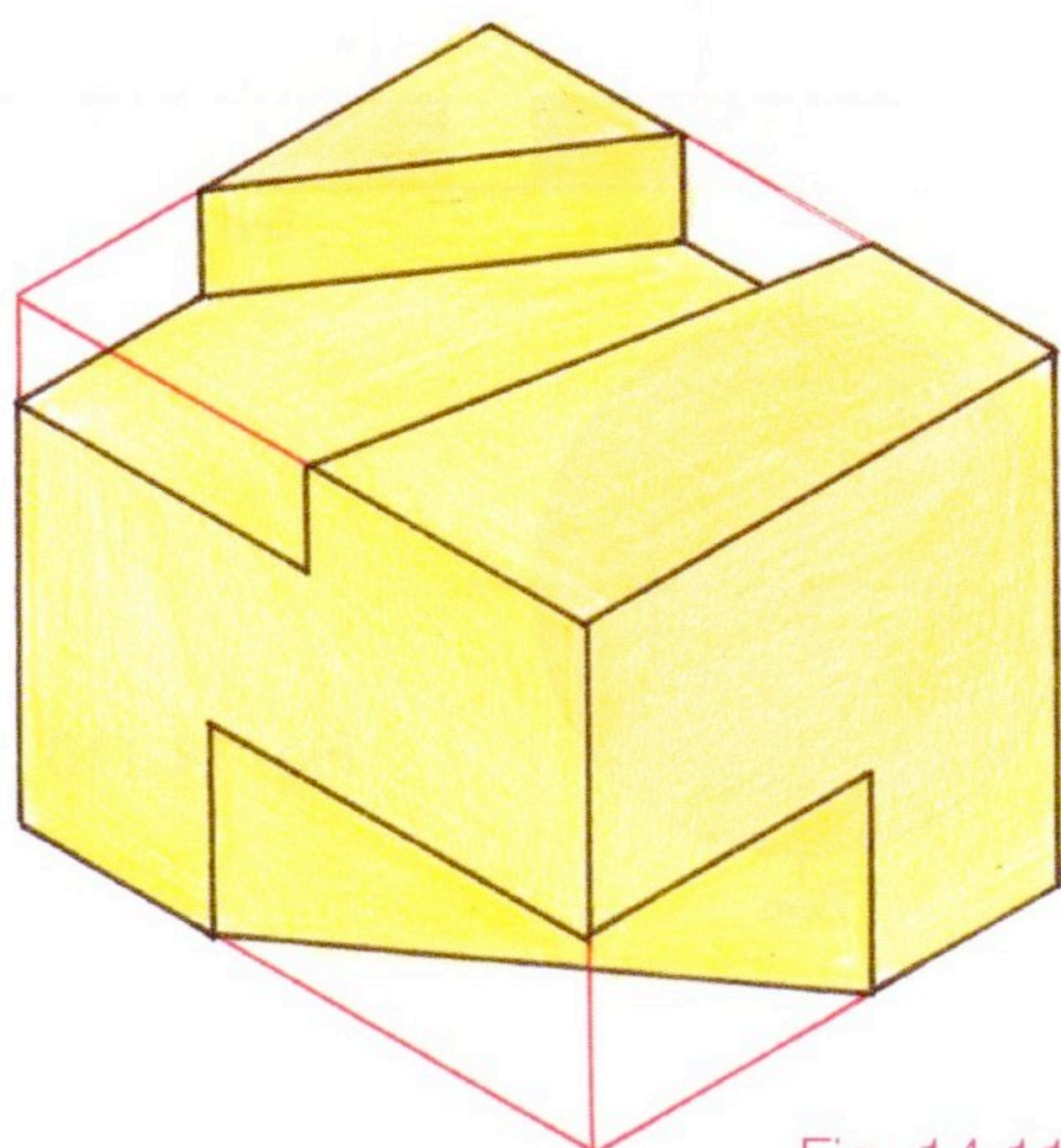Fig. 14.114

Fig. 14.115

Fig. 14.116

Fig. 14.117

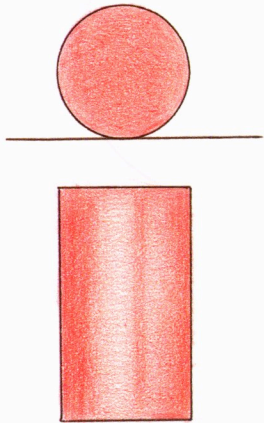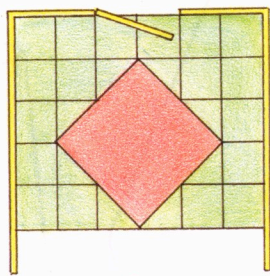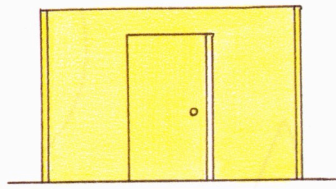Q7. Sketch one-point perspective views of the objects shown in Figures 14.118 to 14.121.
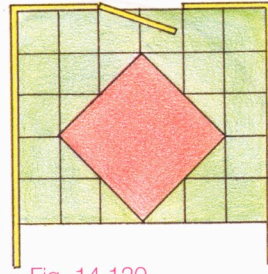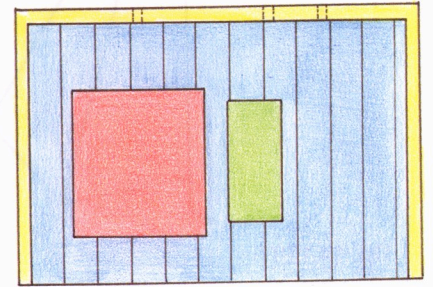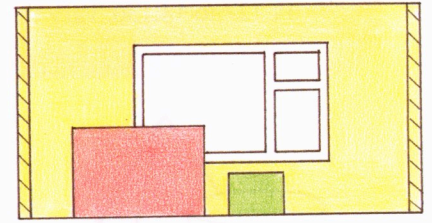
Fig. 14.118

Fig. 14.119
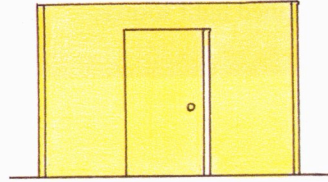
Fig. 14.120

Fig. 14.121

Q8. Make neat two-point perspective sketches of the objects shown in Figures 14.122 to 14.126.
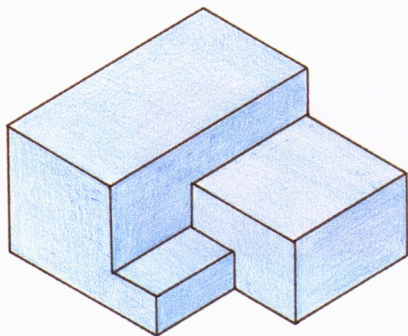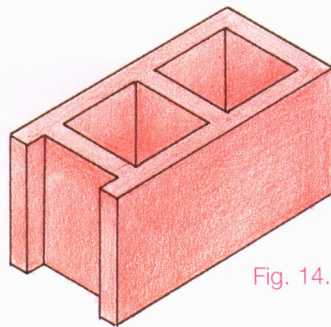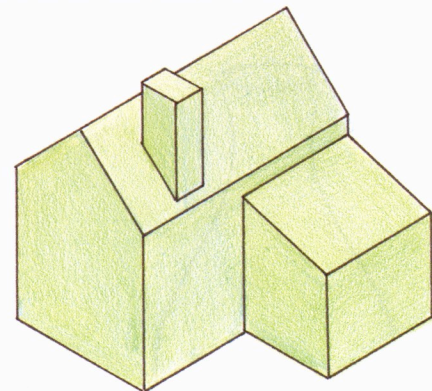Vary the height and position of the spectator to give different views.
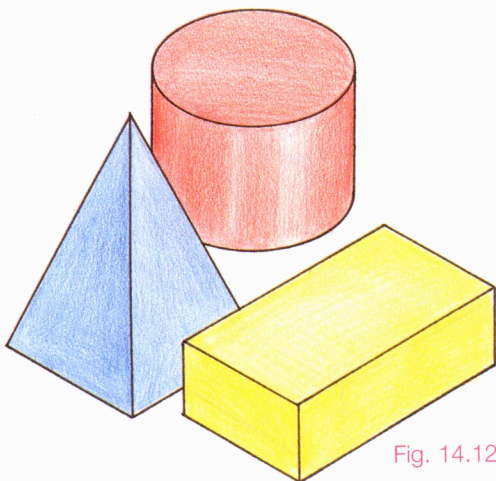
Fig. 14.122

Fig. 14.123

Fig. 14.124

Fig. 14.125

Fig. 14.126