

Question 1: **Archimedian Spiral.** Fig. 1 shows a wrought iron hand rail. The top and bottom ends are in the form of Archimedian spirals. An enlarged version of the spiral is shown in Fig. 2. Using the necessary construction draw **one turn** of an Archimedian spiral to complete the drawing, starting from point A to point B.

10 marks

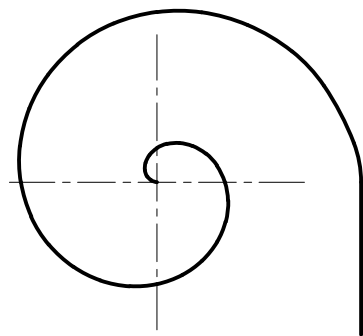


Fig. 2

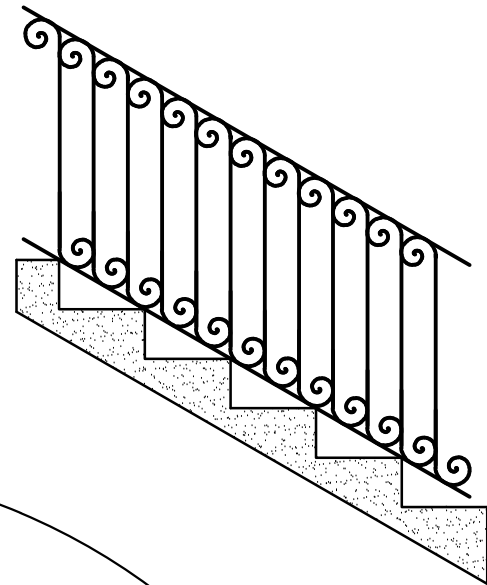
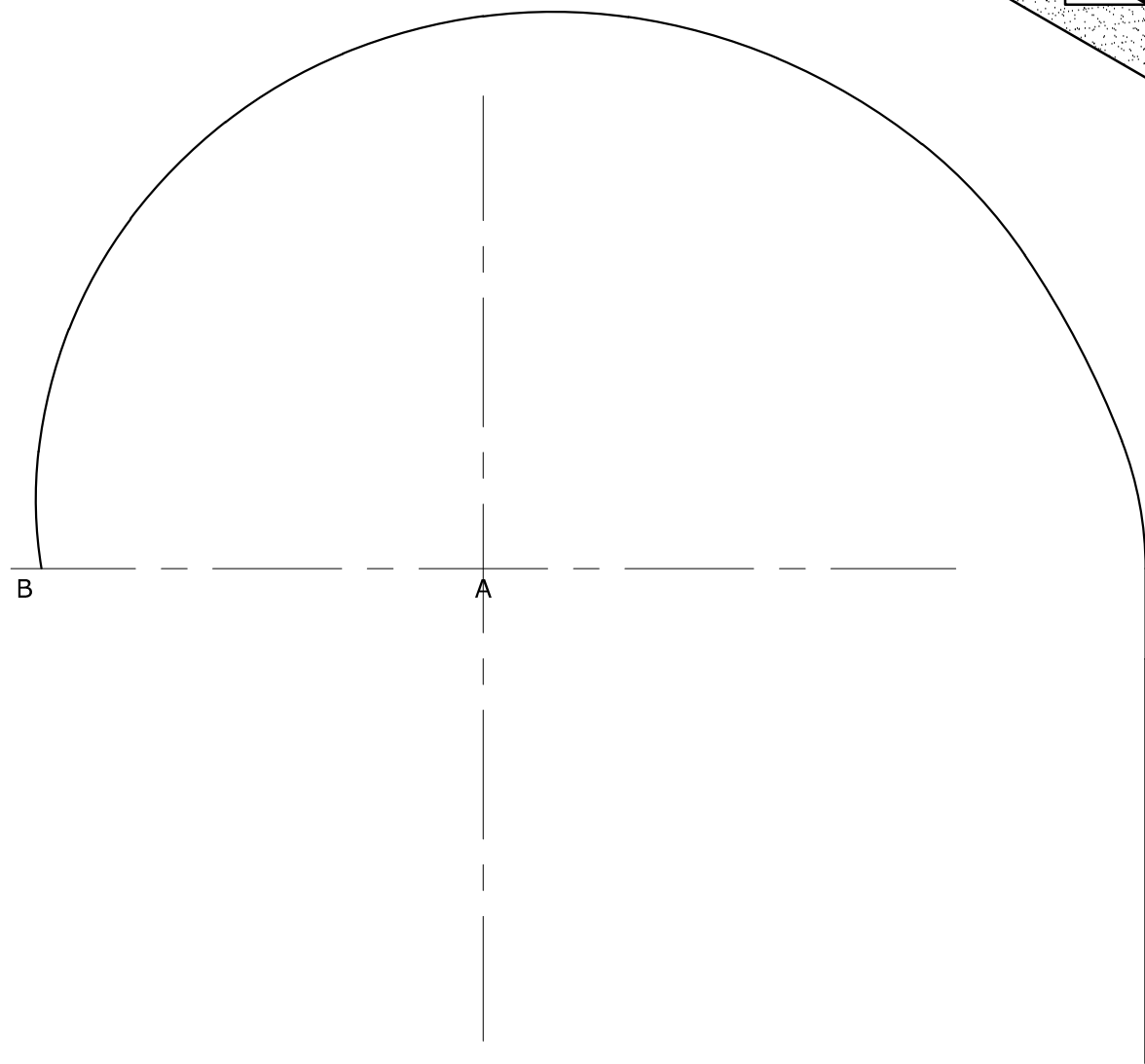


Fig. 1



Question 2: **Circles in Contact.** A simple design of a butterfly is shown in Fig. 3. Draw, to the given dimensions, the top right wing showing clearly by construction how the centres of the arcs are obtained. Show three the points of tangency by drawing short dashes across them.

12 marks

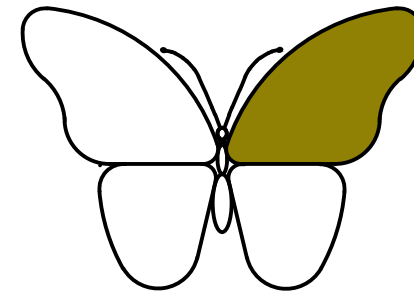
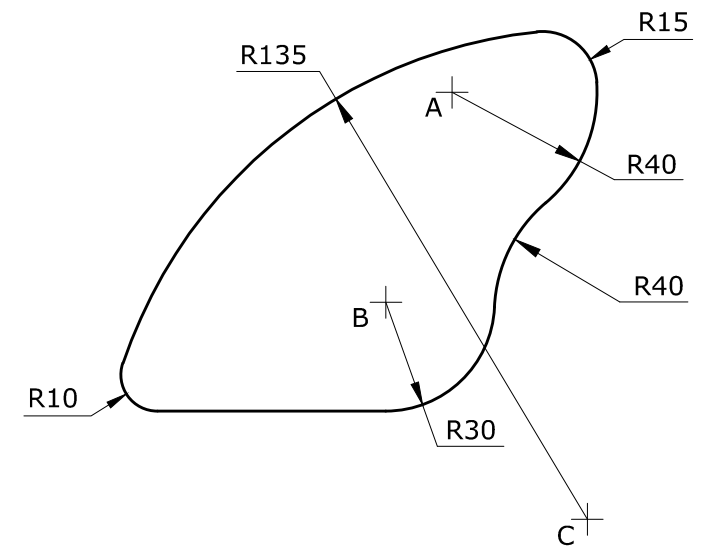
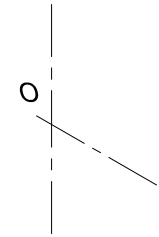
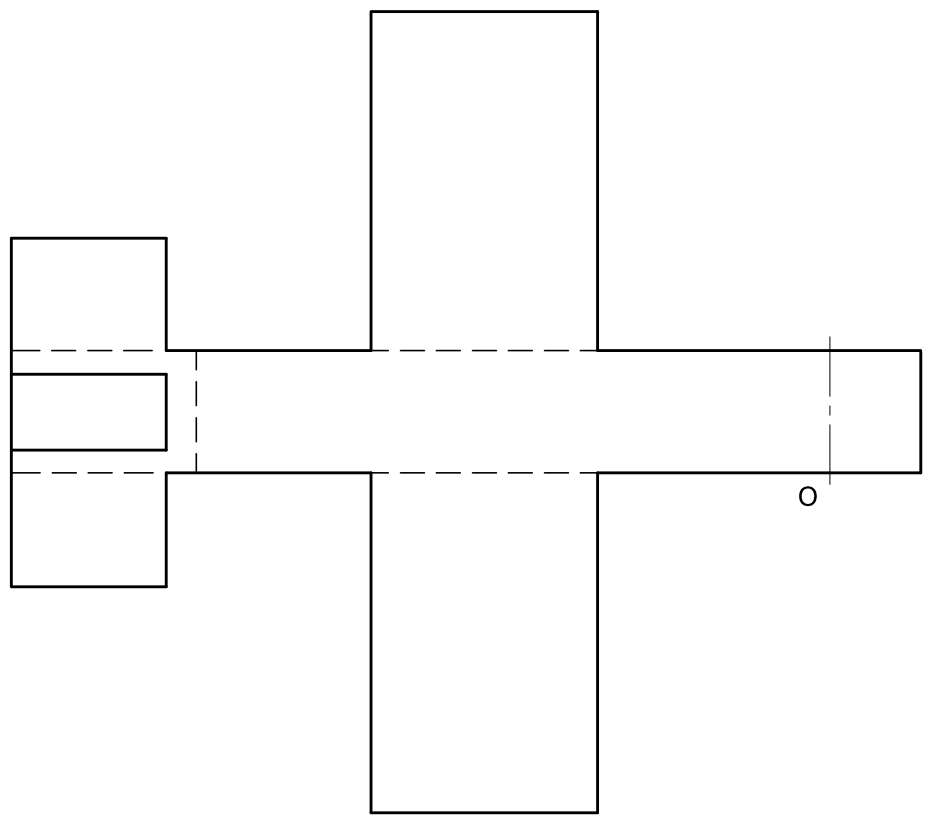
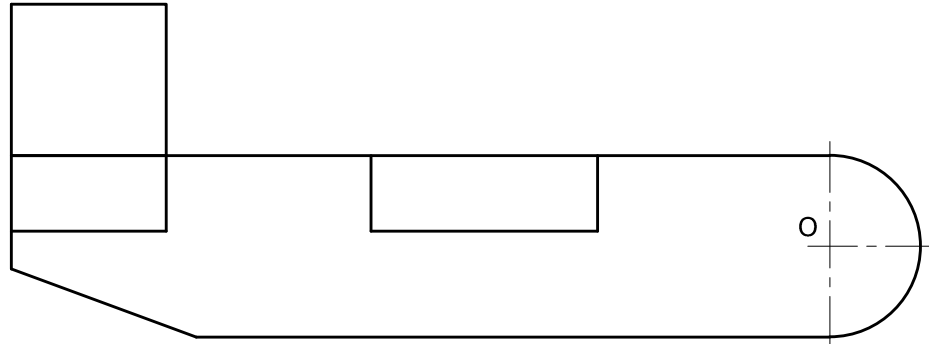
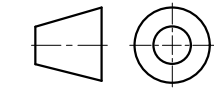


Fig. 3



Question 3: **Isometric Projection.** Two orthographic views of a model plane are shown below. Using the given start centre-lines, draw a full size isometric projection of the model. Take measurements from the orthographic views.

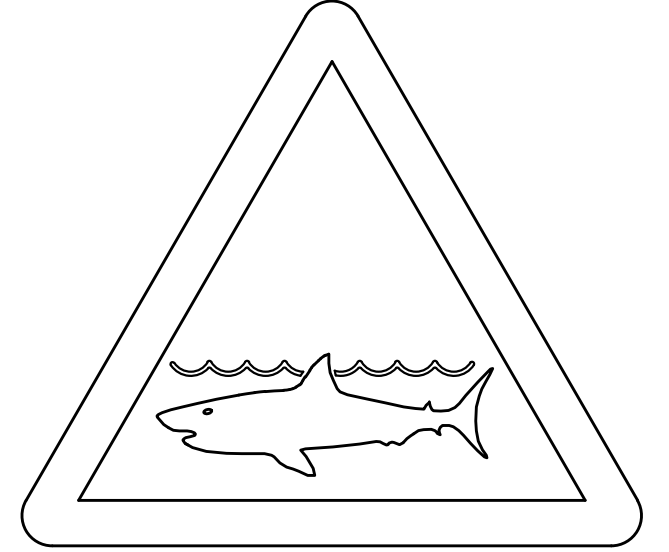
16 marks



ISOMETRIC PROJECTION

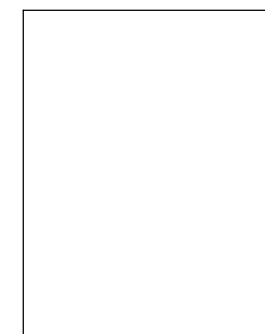
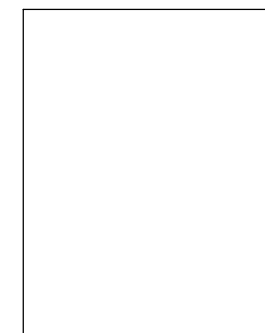
Question 4: **Ideograms.** A **hazard warning sign** is given.  
 a) i. Give the meaning of the sign in the guide lines provided.  
 ii. Colour the sign with the appropriate colours.

4 marks

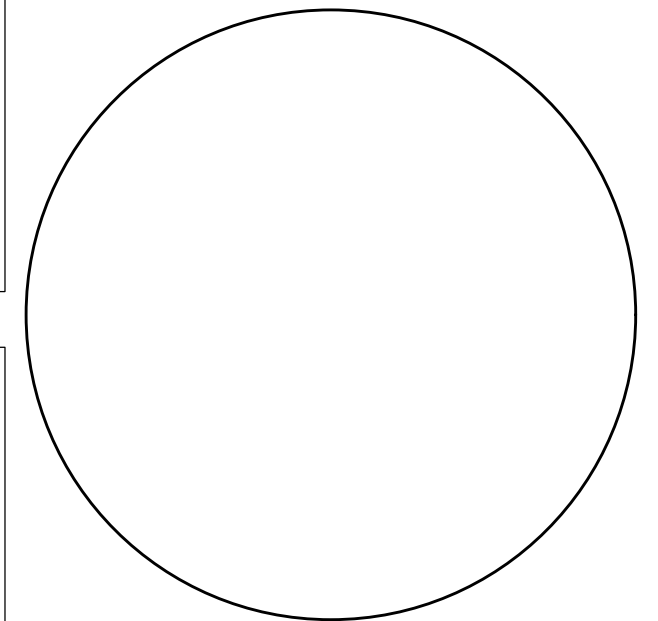


b) A **prohibition sign** is needed at the entrance to a private beach which indicates that dogs are not allowed.  
 a) Draw two preliminary freehand sketches to develop this idea.  
 b) Make a final drawing of the prohibition sign in the circle provided using drawing instruments where necessary.  
 c) Colour your final drawing with the standard colours of a prohibition sign.

8 marks



SKETCHES

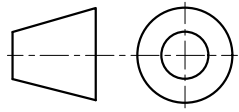


PROHIBITION SIGN

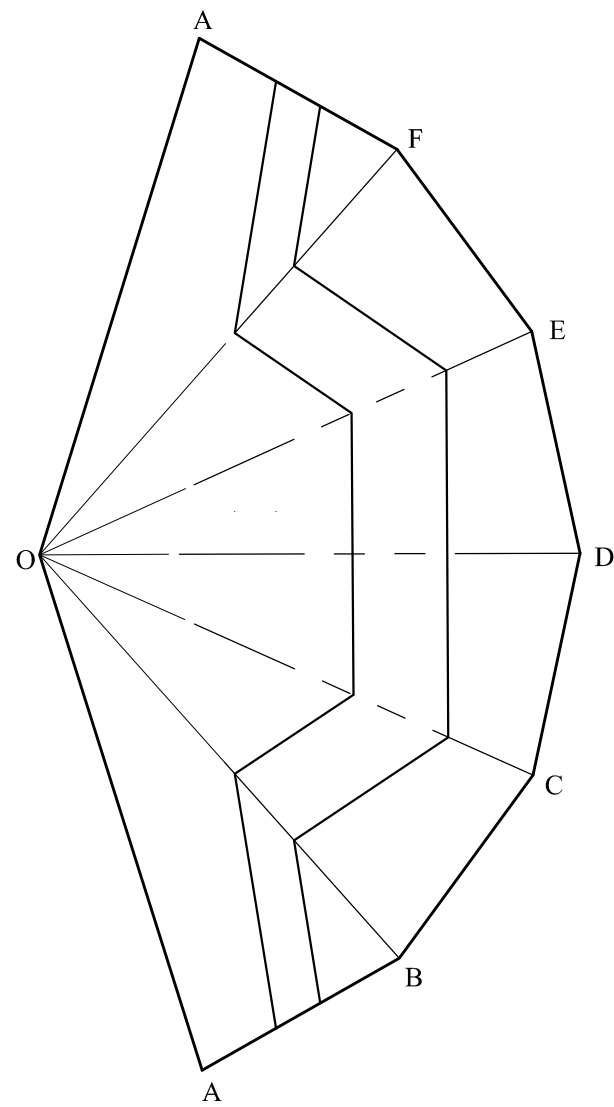
Question 5: **Pyramids.** The drawing shows the development of a cardboard hexagonal pyramid with a line design drawn across it .

- On the given start line BC, complete the plan of the pyramid without the line design.
- Draw the front elevation, taking details from the plan and development. Include the line design.
- Project the line design on the plan, taking details from the front elevation.

12 marks



FRONT ELEVATION



DEVELOPMENT

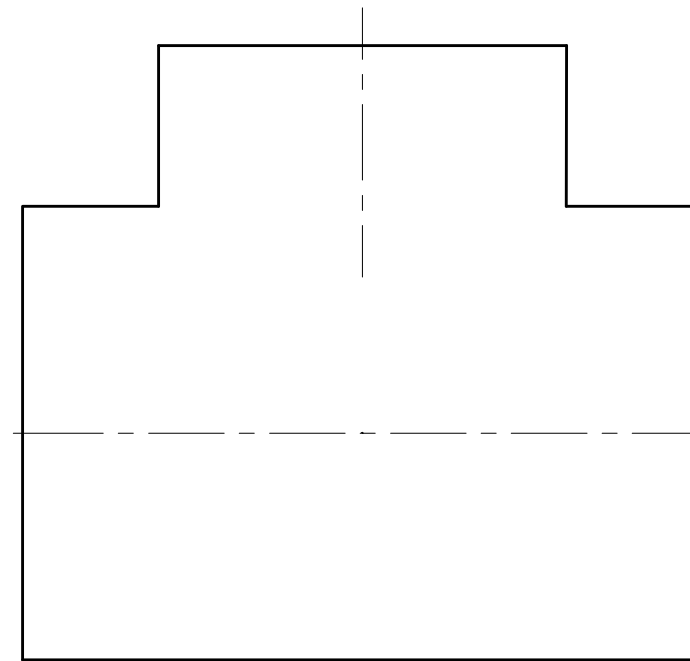
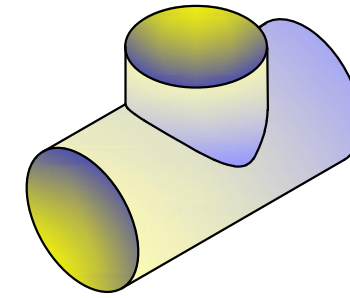
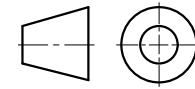


Question 6: **Interpenetrations.** A pictorial view, an incomplete front view, an end view and a plan of two cylinders welded together are shown. The cylinders have unequal diameters and their axes are offset as shown in the end view and plan.

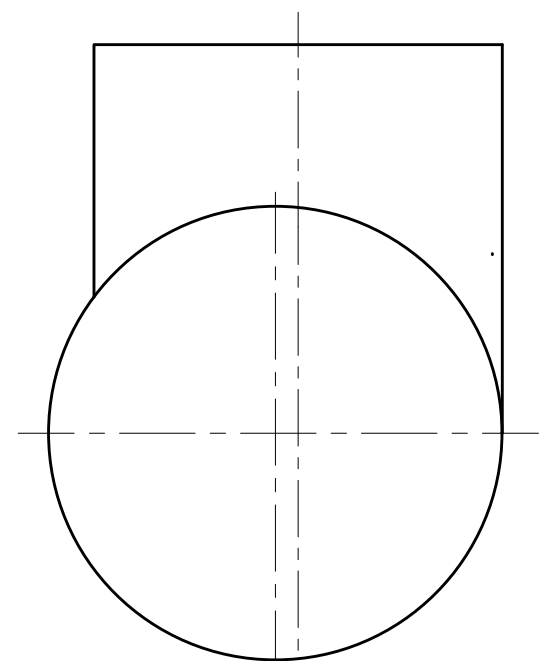
Complete the front view showing clearly the construction to obtain the two curves of intersection. Show hidden detail.

Note: Some construction lines are already drawn on the plan.

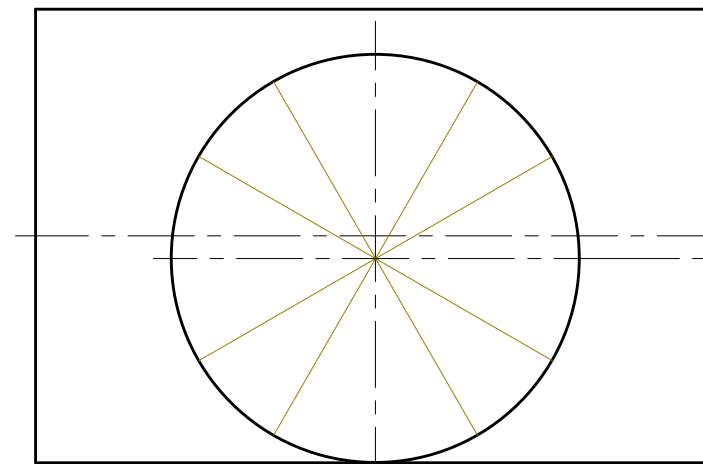
12 marks



FRONT VIEW



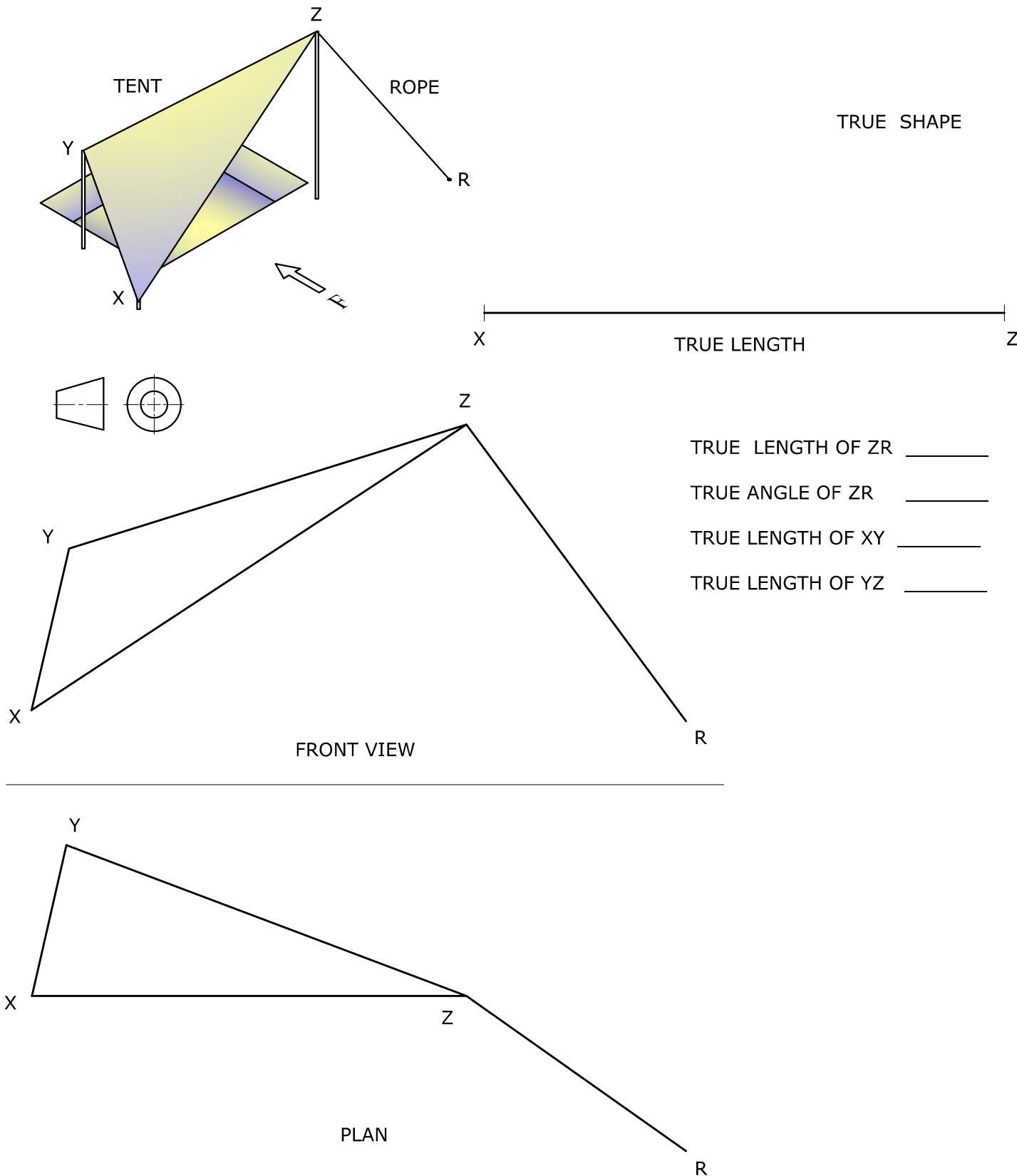
END VIEW



PLAN

Question 7: **Lines in Space.** A triangular tent XYZ is erected on three poles to provide shade on a ditch. The highest pole is supported by a rope ZR. Two orthographic views of the tent and rope are also given.  
 a) Find graphically the true length of rope ZR and its true angle to the horizontal plane (H.P.)  
 b) Find the true length of XY and YZ and draw the true shape of the triangular tent on the given line XZ.

12 marks



Question 8: **Sectional Views.** The drawing shows an end view, the plan and an incomplete sectional front view of a cast-iron bracket. Complete the sectional front view indicated by the cutting plane F-F.

14 marks

