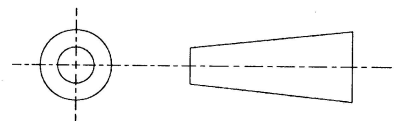


11. Find the true length, true inclination with HP and true inclination with VP, horizontal and vertical traces of the lines whose projections are shown in Fig. Prob. 11 (a), (b) and (c). Also answer the following questions in the same figures.  
 P is a point 30 mm from the lower end of the line, measured along the line. Find its position in plan and elevation [Ref. Fig. Prob. 11(a) and (b)].  
 P is a point on the line AB whose position in plan is shown in Fig. Prob. 11(c). Find its position in elevation.  
 Q is a point on the line AB whose position in elevation is shown in Fig. Prob. 11(c). Find its position in the plan.
12. A line of length 55 mm has one end on HP and 10 mm in front of VP while the other end is 25 mm above HP and 45 mm in front of VP. Draw plan, elevation and view from left.
13. A line is inclined to HP at  $30^\circ$ . It has one end 20 mm above HP and 10 mm in front of VP while the other end is 50 mm above HP and 40 mm in front of VP. Draw plan, elevation and view from left.
14. a) Draw plan and elevation of a regular pentagonal lamina of side 30 mm when it is parallel to and 20 mm in front of VP, one edge being on HP.  
 b) Draw plan, elevation and view from left of the same lamina when it is inclined to the VP at  $45^\circ$  and perpendicular to HP. The point nearest to VP is 20 mm in front of VP and one edge is on HP.
15. a) Draw plan and elevation of a regular hexagonal lamina of side 30 mm when it is parallel to and 15 mm above HP, one edge being parallel to and 10 mm in front of VP.  
 b) Draw plan, elevation and view from left of the same lamina when it is inclined to HP at  $60^\circ$  and perpendicular to VP, the point nearest to HP being 15 mm above HP and at the same distance in front of VP as it was in Prob. 15(a).
16. a) Draw plan and elevation of a regular hexagonal lamina of side 30 mm when it is parallel to and 10 mm above HP, two of its edges being perpendicular to VP. The point nearest to VP is 15 mm in front of VP.  
 b) Draw plan and elevation of the same lamina when it is inclined to HP at  $45^\circ$ , one of the edges which are perpendicular to VP being 10 mm above HP. The point nearest to VP is 15 mm in front of VP.  
 c) Draw plan and elevation of the same lamina when it is inclined to HP at  $45^\circ$  but two of its edges are parallel to both HP and VP, the one nearest to VP being 10 mm above HP and 10 mm in front of VP.
17. Draw plan, elevation and view from left of a circular lamina of diameter 50 mm when it is inclined to VP at  $60^\circ$ , its centre being 30 mm above HP and 40 mm in front of VP.
18. a) Draw plan and elevation of a circular lamina of diameter 50 mm when it is inclined to HP at  $30^\circ$  and perpendicular to VP, its centre being 40 mm above HP and 35 mm in front of VP.  
 b) Draw plan and elevation of the same lamina when it is inclined to HP at  $30^\circ$  and one of its diameters is parallel to both HP and VP, its centre being 40 mm above HP and 35 mm in front of VP.
19. Draw plan, elevation and view from left of a square lamina, side 50 mm when it is inclined to HP at  $45^\circ$ , one of its edges being on HP and  $30^\circ$  to VP.
20. a) Find true shape of the lamina shown in Fig. Prob. 20(a)  
 b) Find true shape of the lamina shown in Fig. Prob. 20(b)

For following problems, answer the questions according to the  
 "THIRD ANGLE" projection system for which the symbol is:



21. a) Draw front view, top view and view from right for the point 'A' which is 10 mm behind VP and 40 mm below HP.  
 b) Draw front view, top view and view from left for the point 'B' which is 15 mm below HP and 45 mm behind VP [Ref. Fig. Prob. 21(a) and (b)].
22. a) Draw front view, top view and view from right for the line shown in Fig. Prob. 22(a).  
 b) Draw front view, top view and view from left for the line shown in Fig. Prob. 22(b).
23. a) Draw front view, top view and view from right for the lamina shown in Fig. Prob. 23(a).  
 b) Draw front view, top view and view from left for the lamina shown in Fig. Prob. 23(b).