EXPERIMENT - 3.

AIM :- SETTING OUT TRIANGLES, GIVEN THE LENGTHS OF SIDES WITH CHAIN AND TAPE.

EQUIPMENT :- CHAIN, TAPE & ARROWS.

THEORY

The principle of chain surveying is **triangulation**. This means that the area to survey is spilled into a number of small triangles which should be well-conditioned. In chain surveying, the side of the triangles are measured directly from the field by chain or tape, and no angular measurements are used.

2.2 WELL-CONDITIONED AND ILL-CONDITIONED TRIANGLES

A triangle is said to be well-conditioned when no angle in it is less than 30° or greater than 120°. An equilateral triangle is considered to be the best-condition or ideal triangle (Figs 2.1(a) and (b)).

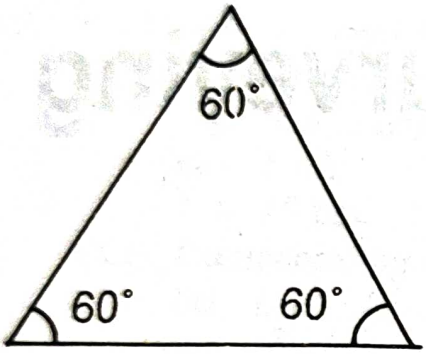


Fig. 2.1(a) Ideal Triangle

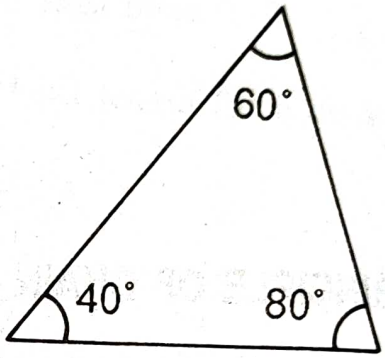


Fig. 2.1(b) Well-Conditioned Triangle

Well-conditioned triangles are preferred because their apex points are very sharp and can be located by a single 'dot'. In such a case, there is no possibility of relative displacement of the plotted point.

A triangle in which an angle is less than 30° or more than 120° is said to be ill-conditioned (Fig. 2.1(c)).

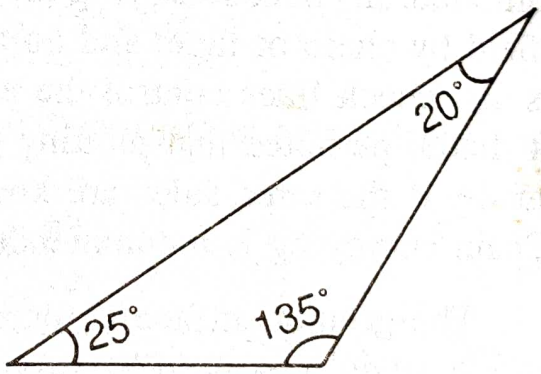
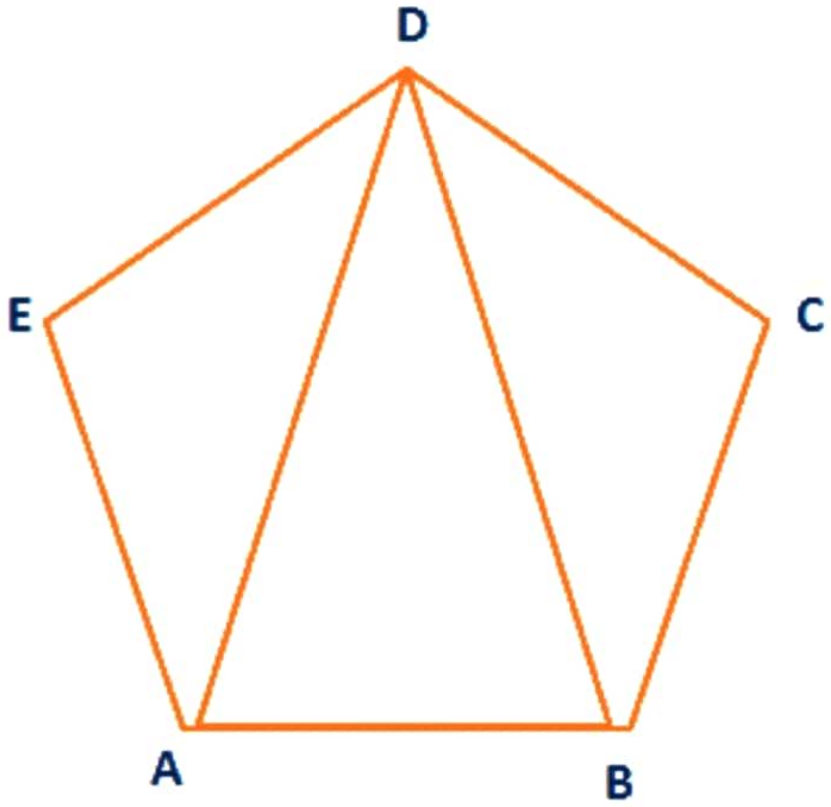


Fig. 2.1(c) Ill-Conditioned Triangle

Ill-conditioned triangles are not used in chain surveying. This is because their apex points are not sharp and well defined, which is why a slight displacement of these points may cause considerable error in plotting.

Procedure:



- Let ABCDE be the given field whose area is to be measured, fix the pegs at A, B, C, D & E.
- Divide area into three triangles ADE, ABD and BCD by joining AD and BD.
- Measure the lengths AB, BC , CD, DE, EA, AD and BD.
- Calculate the area of the triangles.
- The sum of the areas of the three triangles is the area of the given field.

$$Areaof\Delta = \sqrt{(S(S-a)(S-b)(S-c))}$$

$$S = \frac{a+b+c}{2}$$

Result:

The area of the given field = _____