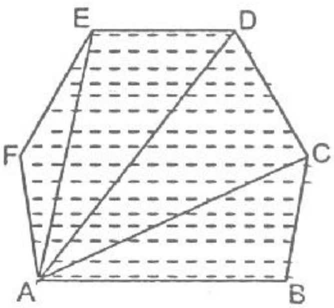
CHAPTER – 9
AREA OF PARALLELOGRAM AND TRIANGLE

9.1 INTRODUCTION

POLYGONAL REGION

Polygon region can be expressed as the union of a finite number of triangular regions in a plane such that if two of these intersect, their intersection is either a point or a line segment. It is the shaded portion including its sides as shown in the figure.



(a) Area Axioms :

Every polygonal region R has an area, measure in square unit and denoted by ar(R).

(i) **Congruent area axiom :** if R_1 and R_2 be two regions such that $R_1 \cong R_2$ then $ar(R_1) = ar(R_2)$.

(ii) **Area monotone axiom :** If $R_1 \subset R_2$, then are $(R_1) \leq ar(R_2)$.

(iii) **Area addition axiom :** If R_1 are two polygonal regions, whose intersection is a finite number of points and line segments and $R = R_1 \cup R_2$, then $ar(R) = ar(R_1) + ar(R_2)$.

(iv) **Rectangular area axiom :** If AB = a metre and AD = b metre then,

ar (Rectangular region ABCD) = ab sq. m.

(b) Unit of Area :

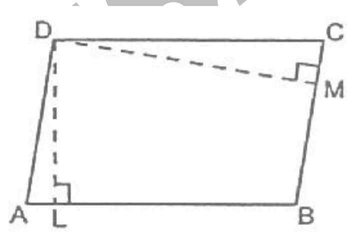
There is a standard square region of side 1 metre, called a square metre, which is the unit of area measure. The area of a polygonal region is square metres (sq. m or m^2) is a positive real number

AREA OF A PARALLELOGRAM

(a) Base and Altitude of a Parallelogram :

(i) Base : Any side of parallelogram can be called its base.

(ii) Altitude : The length of the line segment which is perpendicular to the base from the opposite side is called the altitude or height of the parallelogram corresponding to the given base.



In the Adjoining Figure

(i) DL is the altitude of $\|^{gm}$ ABCD, corresponding to the base AB.

(ii) DM is the altitude of $\|^{gm}$ ABCD, corresponding to the base BC.