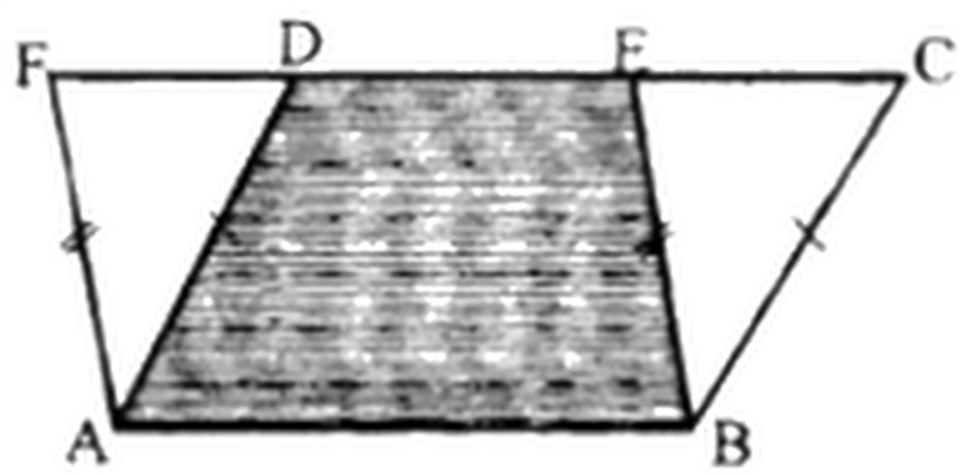
Unit 16

THEOREMS RELATED WITH AREA

THEOREM 16.1.1

Parallelograms on the same base and between the same parallel lines (or of the same altitude) are equal in area.

Solution:



Given:

Two parallelograms ABCD and ABEF having the same base AB and between the same parallel lines AB and DE.

To Prove:

Area of parallelogram ABCD = Area of parallelogram ABEF

Proof

Statements	Reasons
area of (parallelogram ABCD) = area of (quadrilateral ABED) + area of (ΔCBE) ... (1) area of (parallelogram ABEF) = area of (quadrilateral ABED) + area of	Area addition axiom

$m\overline{CB} = m\overline{DA}$	
$m\overline{BE} = m\overline{AF}$	opposite sides of a parallelogram
$m\angle CBE = m\angle DAF$	opposite sides of a parallelogram
$\therefore \Delta CBE \cong \Delta DAF$	opposite sides of a parallelogram
$\therefore$ area of (Δ CBE) = area of (Δ DAF) ...(3)	S.A.S. congruent axiom
Hence area of (parallelogram ABCD)	congruent area axiom
= area of (parallelogram ABEF)	from (1), (2) and (3)