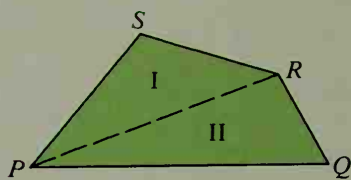
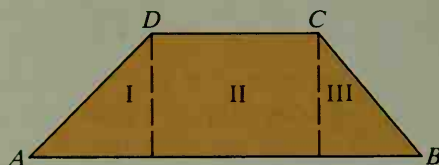


Postulate 19 Area Addition Postulate

The area of a region is the sum of the areas of its non-overlapping parts.

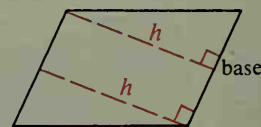
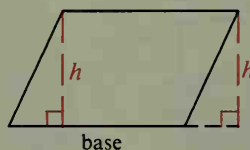
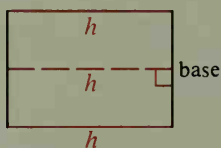
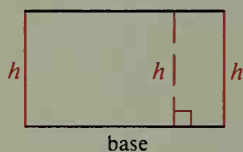


Area of $PQRS$ = Area I + Area II



Area of $ABCD$ = Area I + Area II + Area III

Any side of a rectangle or other parallelogram can be considered to be a **base**. The length of a base will be denoted by b . In this text the term *base* will be used to refer either to the line segment or to its length. An **altitude** to a base is any segment perpendicular to the line containing the base from any point on the opposite side. The length of an altitude is called the **height** (h). All the altitudes to a particular base have the same length.



Theorem 11-1

The area of a rectangle equals the product of its base and height.

($A = bh$)

Given: A rectangle with base b and height h

Prove: $A = bh$

Proof:

Building onto the given shaded rectangle, we can draw a large square consisting of these non-overlapping parts:

- the given rectangle with area A
- a congruent rectangle with area A
- a square with area b^2
- a square with area h^2

$$\text{Area of big square} = 2A + b^2 + h^2$$

$$\text{Area of big square} = (b + h)^2 = b^2 + 2bh + h^2$$

$$2A + b^2 + h^2 = b^2 + 2bh + h^2$$

$$2A = 2bh$$

$$A = bh$$

(Area Addition Postulate)

($A = s^2$)

(Substitution Prop.)

(Subtraction Prop. of =)

(Division Prop. of =)

