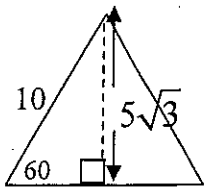
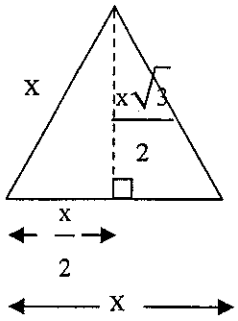
Area of Equilateral Triangle

Equilateral triangle with sides of 10 cm. each -



$A_{triangle} = \frac{1}{2}bh$

In general -



$A_{triangle} = \frac{1}{2}bh$

$$A_{\text{equilateral }\Delta} = \frac{x^2\sqrt{3}}{4} \text{ where } x \text{ is side of } \Delta$$

Example 1

Find the height of a trapezoid that has an area of 287 square inches and bases of 38 inches and 44 inches.

$$A_{trapezoid} = \frac{1}{2}h(b_1 + b_2)$$

Example 2

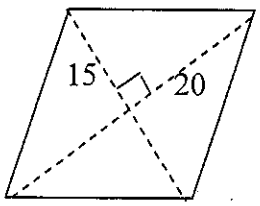
Find the height of a trapezoid that has an area of 84 cm^2 if its median is 12 cm.

$A_{trapezoid}$ = (median)(height)

Example 3

Sonja wants to place a decorative brick edging around a flower garden that is in the shape of a rhombus. One diagonal is 30 feet long, and the area is 600 square feet. How many bricks must she purchase if each brick is one foot long?

$$Area_{rhombus} = \frac{1}{2}d_1d_2$$

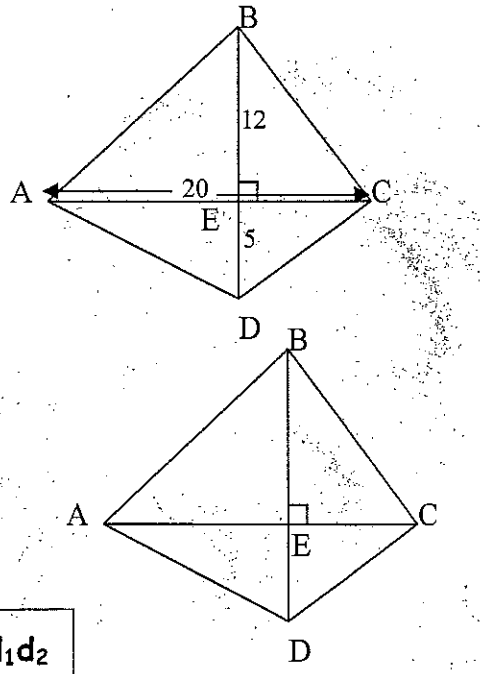


Example 4

Find the area of an equilateral triangle with perimeter 60 cm.

Notes for 10-2

Area of Quadrilateral ABCD with Perpendicular Diagonals



Area of Quadrilateral ABCD = Area of ΔABC + Area of ΔADC

Area of Quadrilateral ABCD =

or

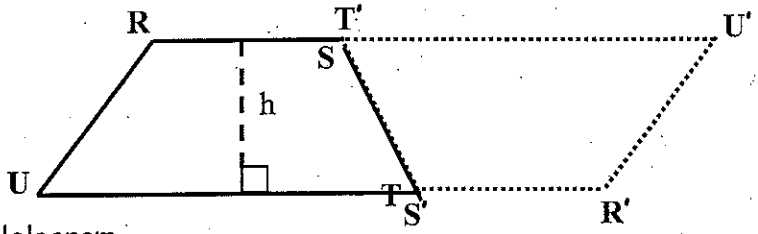
Area of Quadrilateral ABCD =

Area of a Quadrilateral with Perpendicular Diagonals = $\frac{1}{2}d_1d_2$

What special quadrilaterals have perpendicular diagonals?

$Area_{rhombus} = \frac{1}{2}d_1d_2$	$Area_{kite} = \frac{1}{2}d_1d_2$	$Area_{square} = \frac{1}{2}d^2$ (Diagonals of a square are $\cong$)

Area of Trapezoid RSTU



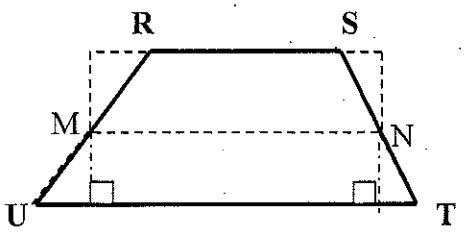
Copy trapezoid RSTU and call it R'S'T'U'. Rotate the copy around the midpoint of segment ST. The resulting figure is a parallelogram RU'R'U. The original trapezoid RSTU is half of that parallelogram.

$A_{trapezoid} = \frac{1}{2}(h)(RS + TU)$

$A_{trapezoid} = \frac{1}{2}(h)(b_1 + b_2)$ where h is height and b_1 and b_2 are the bases

or

Construct $\overline{MN}$, the median of trapezoid RSTU.
Drop perpendiculars from M and N to base $\overline{UT}$.
Rotate the small triangles that are formed around the midpoints, M and N. A rectangle with length MN is formed.



$A_{trapezoid}$ = (median)(height)