Section 9.4

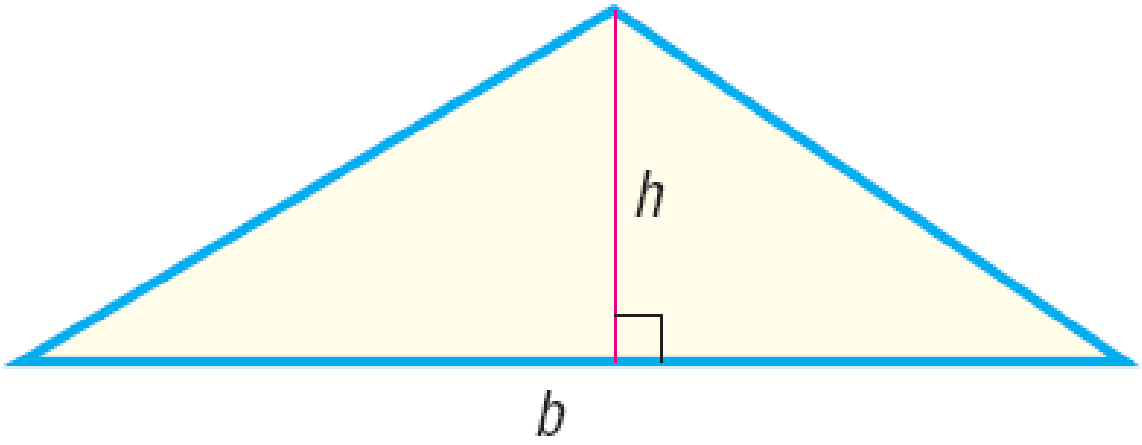
Area of a Triangle

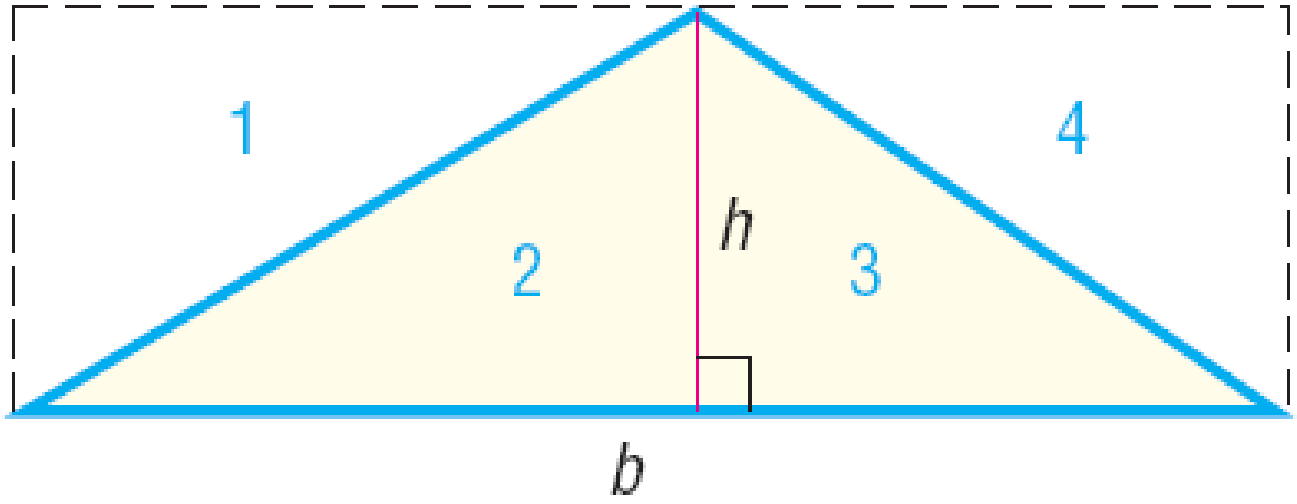
Theorem

The area K of a triangle is

$$K = \frac{1}{2}bh$$

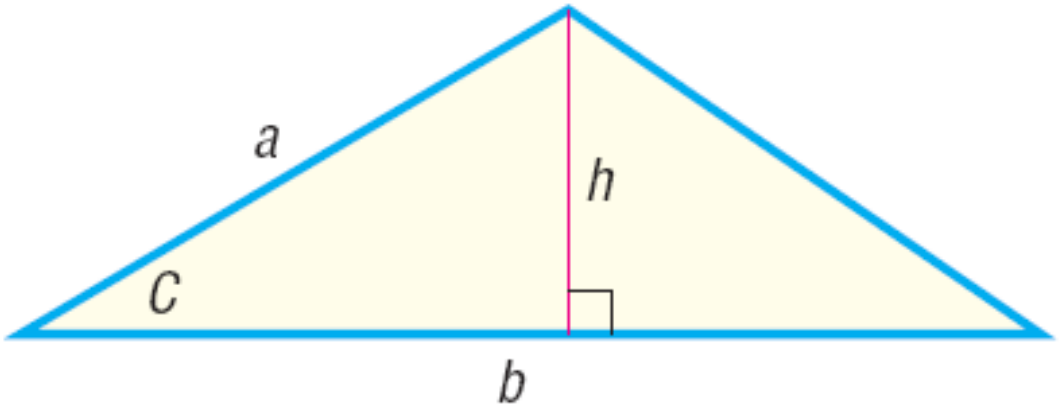
where b is the base and h is an altitude drawn to that base.


h
b


1
2
h
3
4
b

OBJECTIVE 1

1 Find the Area of SAS Triangles



$$K = \frac{1}{2}ab \sin C$$

$$K = \frac{1}{2}bc \sin A$$

$$K = \frac{1}{2}ac \sin B$$

The area A of a triangle equals one-half the product of two of its sides times the sine of their included angle.

EXAMPLE

Finding the Area of a SAS Triangle

Find the area K of the triangle for which: $b = 8$, $c = 5$, $A = 40$

OBJECTIVE 2

2 Find the Area of SSS Triangles

Theorem

Heron's Formula

The area K of a triangle with sides a, b, and c is

$$K = \sqrt{s(s-a)(s-b)(s-c)}$$

where $s = \frac{1}{2}(a + b + c)$.

EXAMPLE

Finding the Area of a SSS Triangle

Find the area of a triangle whose sides are 2, 4, and 7.