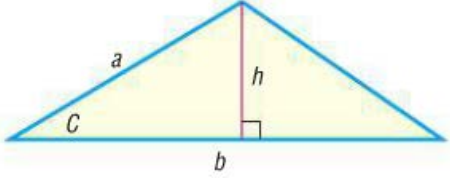


**Precalculus**  
**Lesson 8.4: Area of a Triangle**  
**Mrs. Snow, Instructor**

If we know two sides of a triangle and the included angle we may apply the general formula for the area of a triangle (SAS).

$\sin C = \frac{h}{a}$ solving for h: $h = a \sin C$ so area is: $K = \frac{1}{2}bh = \frac{1}{2}ab \sin C$	
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To find area of a triangle knowing SAS

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

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

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

From the law of cosines comes **Heron's Formula** that may be used to find the area of a triangle if only given the lengths of the three sides (SSS):

For a triangle with sides of lengths  $a$ ,  $b$ , and  $c$ , it will have a **semiperimeter** of:

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

the area of the triangle is:

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

Find the area of a triangle whose sides are  
 $a = 4, b = 5, c = 7$

Find the area of the triangle:

