

## § 8.4 Area of a Triangle

**Area of a Triangle (SAS)** - The area of triangle ABC is one-half the product of the lengths of any two sides and the sine of the included angle.

$$K = \frac{1}{2}bc \sin A = \frac{1}{2}ab \sin C = \frac{1}{2}ac \sin B$$

**Example 1** Find the area  $K$  of a triangular lot having two sides of lengths 8 meters and 6 meters and an included angle of  $30^\circ$ .

**Heron's Formula (SSS)** - If a, b and c are the lengths of the sides of a triangle, then the area of the triangle is

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)} \quad \text{where } s = \frac{1}{2}(a+b+c)$$

**Example 2** Find the area of a triangle having sides of lengths  $a = 4$  meters,  $b = 5$  meters, and  $c = 7$  meters.