

§ 9.4 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° .

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.