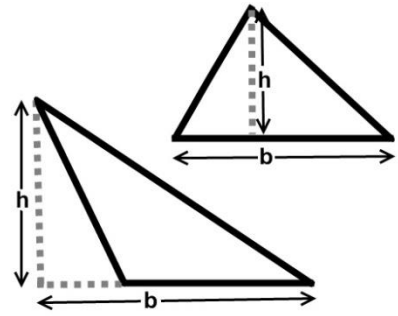


Area of a Triangle

The most common formula for area of a triangle is $A = \frac{1}{2}bh$ where b is base and h is height.



But what if we don't know the height? GET CREATIVE ☺

By using the right triangle on the left side of the diagram, and our knowledge of trigonometry, we can state that:

$$\sin C = \frac{h}{b}$$

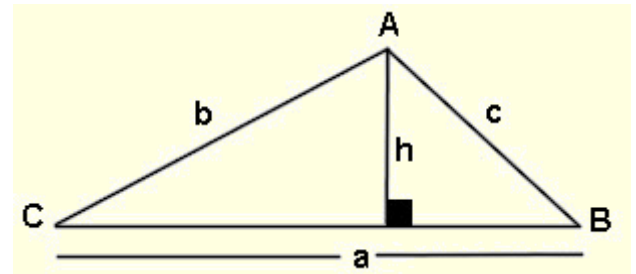
$$b \sin C = h$$

Thus, the height can be expressed as $b \sin C$

If we substitute this in to our common area formula we get:

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

where a and b are adjacent sides and C is the included angle (**THIS HAS TO BE TRUE!**)



Example 1: Find the area of a triangle with the sides of length 7 and 9 and the included angle of 72° .

Example 2: Find the area of a triangle with the sides of length 10 and 22 and the included angle of 10° .

Example 3: Find the area of an equilateral triangle with side length of 10.

Example 4: In $\triangle ABC$, $AB = 12$ meters and $AC = 20$ meters. If the area of the triangle is 77 sq. meters, find the measure of $\angle A$, to the nearest degree.

Example 5: A farmer has a triangular field where two sides measure 450 yards and 320 yards. The angle between these two sides measures 80° . The farmer wishes to use an insecticide that costs \$4.50 per 100 sq. yards or any part of 100 yds. What will it cost to use this insecticide on this field?

Unit 2 Day 3 HW

Find the area of the triangle.

1. In $\triangle ABC$, $AB = 10$, $AC = 8$, and $m\angle A = 45^\circ$. Find the area of $\triangle ABC$, to the *nearest tenth* of a square unit.
2. In an isosceles \triangle , the two equal sides each measure 24 meters, and they include an angle of 30° . Find the area of the isosceles triangle, to the *nearest sq. meter*.
3. A triangle has two sides of 30 meters and 26 meters, and the angle between them is an obtuse angle. If the area of the triangle is 300 sq. meters, find the measure of the obtuse angle (to the
4. If the vertex angle of an isosceles triangle measures 30° and each leg measures 4, find the area of the triangle.
5. The vertex angle of isosceles triangle ABC measures 30° , and each leg has length 20. What is the area of ABC?
6. Jack is planting a triangular rose garden. The lengths of two sides of the plot are 8 feet and 12 feet, and the angle between them is 87° . Write an expression that could be used to find the area of this garden?