

## Section 7.2

### Area of a Triangle

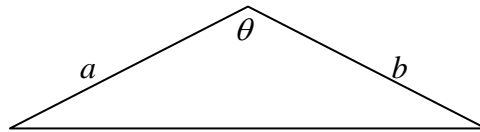
#### Area of a triangle

Given the base,  $b$ , and the height,  $h$ , of a triangle we can calculate its area by applying the formula:  $A = \frac{1}{2}bh$

Example 1: Find the area of triangle ABC, where  $m\angle C = 90^\circ$ ,  $a = 3\text{mm}$  and  $c = 11\text{mm}$ .

If we are not given the base and the height of the triangle, but given two sides and the angle *between* them then we can still calculate its area by applying the

formula:  $A = \frac{1}{2}ab \sin \theta$



Example 2: Find the area of the equilateral triangle with side lengths 10 ft.

Example 3: Find the area of triangle JAK with angle  $K = 91^\circ$ , angle  $J = 28^\circ$ ,  $k = 266\text{ m}$ , and  $j = 125\text{ m}$ .

Try this one: Find the area of triangle ABC with angle  $C = 45^\circ$ ,  $a = 5$  cm and  $b = 8$  cm.

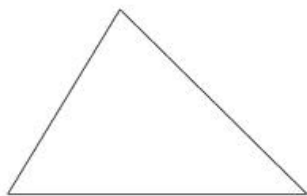
Example 4: If the area of  $\triangle ABC$  is 20 square centimeters,  $a = 16$  cm and  $c = 5$  cm, find all possible measures for angle B.

Try this one: If the area of triangle ABC is 14 square meters, with  $a = 15$  m and  $b = 6$  m, find all possible measures for angle C. Round answers to the nearest hundredth.

Try this one: In  $\triangle ABC$ , the measure of  $\angle A = (2x)^\circ$ ,  $c = 5$  in,  $b = \frac{\sqrt{6}}{4}$  in and  $\sin x = \frac{1}{5}$ .

Find the area of  $\triangle ABC$ . *Hint: The double angle formula for sine will be useful.*

$$\sin(2x) = 2\sin x \cos x$$



Example 5: A regular hexagon is inscribed in a circle of radius 4m. Find the area of the hexagon.

