Warm-up 3/21/17
Solve the triangle.
B = 35°, a = 43, c = 19

$b^2 = 43^2 + 19^2 - 2(43)(19)\cos 35$

$b \approx 29.52$

$\frac{\sin 35}{29.52} = \frac{\sin C}{19}$

$A = 123.3^\circ$

$\sin C = \frac{19 \sin 35}{29.52}$

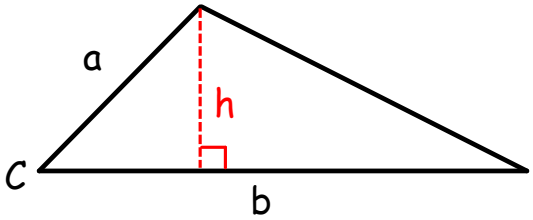
$C \approx 21.7^\circ$

The Area of a Triangle

The area of a triangle is

$$A = \frac{1}{2}bh$$

where b is the base and h is the altitude drawn to the base.



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

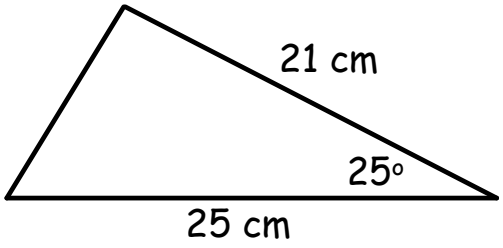
$a \sin C = h$

So, $Area = \frac{1}{2}ab(\sin C)$

In general,
The area of a triangle equals one-half the product of two of its sides times the sine of their included angle.

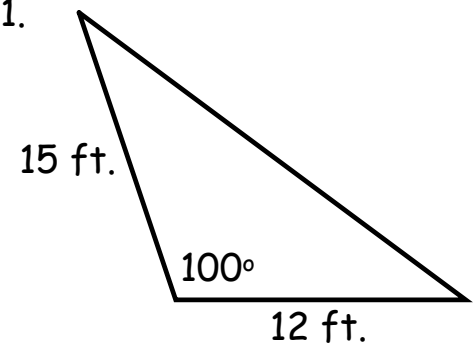
$A = \frac{1}{2}(25)(21)(\sin 25)$

$A \approx 110.9 \text{ cm}^2$



Find the area of each triangle.

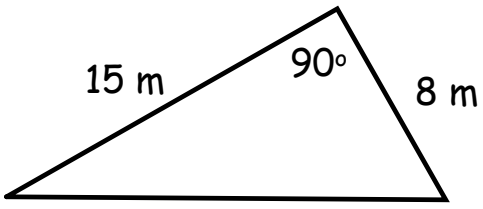
1.



$A = \frac{1}{2}(15)(12)(\sin 100)$

$\approx 88.6 \text{ ft}^2$

2.



$A = \frac{1}{2}(15)(8)(\sin 90)$

$= 60 \text{ m}^2$

Heron's Formula

The area A of a triangle with sides a, b and c is

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

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

Find the area of the triangle whose sides are 14, 17 and 19.

$s = \frac{1}{2}(14+17+19)$ $A = \sqrt{25(25-14)(25-17)(25-19)}$

$s = 25$ $A \approx 114.9$

Find the area of the triangle whose sides are 20, 48 and 52.

$s = \frac{1}{2}(20+48+52)$ $A = \sqrt{60(60-20)(60-48)(60-52)}$

$= 60$ $A = 480$

Assignment: pp. 448 - 449

17 - 28, 31, 33, 40, 47, 48