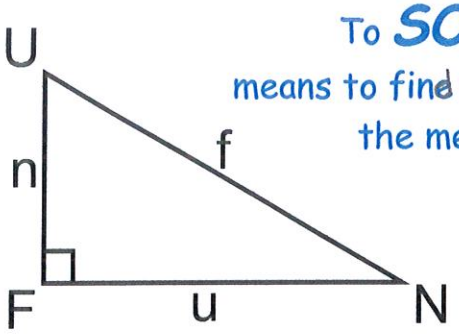
Solving Right Triangles

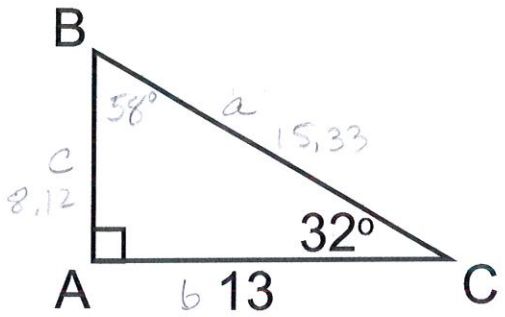


To **SOLVE A TRIANGLE**
means to find the lengths of all missing sides and the measures of all missing angles.

To **SOLVE A RIGHT TRIANGLE** use:

* the sum of the angles in a triangle is 180°
* Trig Ratios - SOH CAH TOA (preferred)
*Pythagorean Theorem (for checking ONLY!)

Example 1:



A = 90° a = 15.33

B = 58° b = 13

C = 32° c = 8.12

Side c

$\frac{(13)\tan 32}{(13)} = \frac{c}{13}$ (13)

$13\tan 32 = c$

$8.12 = c$

Side a

$8.12^2 + 13^2 = a^2$

$234.93 = a^2$

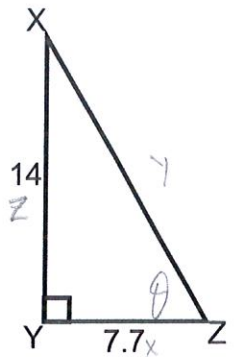
$15.33 = a$

Angle B

$180 - 90 - 32$

$= 58°$

Example 2:



X = 28.81° x = 7.7

Y = 90° y = 15.98

Z = 61.19° z = 14

Angle Z

$\tan\theta = \frac{14}{7.7}$

$\theta = \tan^{-1}\frac{14}{7.7}$

$\theta = 61.19°$

Angle X

90 - 61.19

$= 28.81°$

Side Y

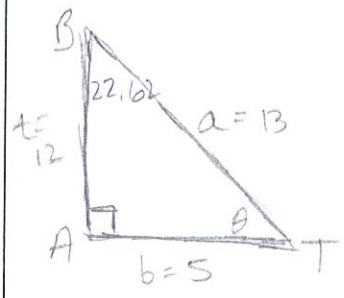
$14^2 + 7.7^2 = y^2$

$255.29 = y^2$

$15.98 = y$

Example 3:

Solve triangle BAT given that angle A is the right angle, side b = 5 and side t = 12.



B = 22.62° b = 5

A = 90° a = 13

T = 67.38° t = 12

Angle T

$\tan\theta = \frac{12}{5}$

$\theta = \tan^{-1}\frac{12}{5}$

$\theta = 67.38°$

Angle B

90 - 67.38

$= 22.62°$

Side a

$12^2 + 5^2 = a^2$

$144 + 25 = a^2$

$13 = a$