

Unit 6 - Right Triangles

• Right triangle Review:

- can sides make a Δ ?

Ex: a, b, c
 $4, 14, 6$

$a + b > c$? NO

$4 + 6 > 14$?

* make sure the sum of the two smallest is greater than the longest.

- classify as acute, obtuse, or right

$$c^2 \square a^2 + b^2$$

if $c^2 > a^2 + b^2$ (OBTUSE)

if $c^2 < a^2 + b^2$ (ACUTE)

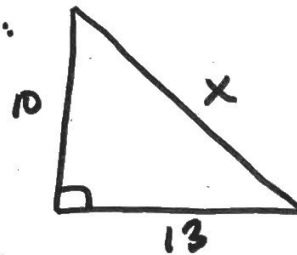
if $c^2 = a^2 + b^2$ (RIGHT)

• Pythagorean Theorem:

- use to find a missing side when we already have 2 sides.

$$a^2 + b^2 = c^2$$

Ex:

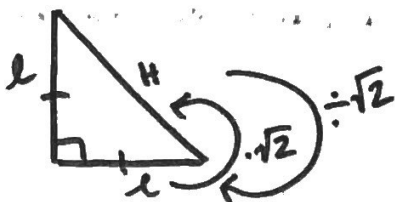


$$\begin{aligned} 10^2 + 13^2 &= x^2 \\ 100 + 169 &= x^2 \\ \sqrt{269} &= \sqrt{x^2} \end{aligned}$$

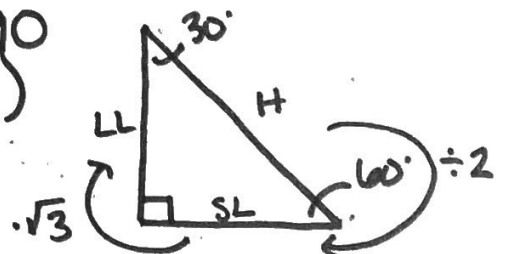
$x = \sqrt{269} \text{ or } 16.4$

• Special Rt Δ 's:

45-45-90 ($\sqrt{2}$)



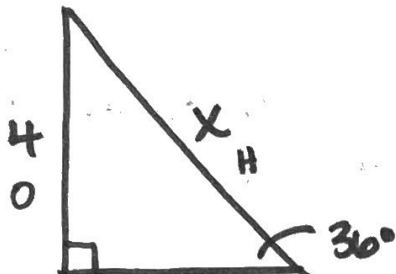
30-60-90 ($2, \sqrt{3}$)



$S^{\circ} H C^A H T^{\circ} A$

- used to find a missing side when we already have 1 side & 1 angle (acute)

EX:



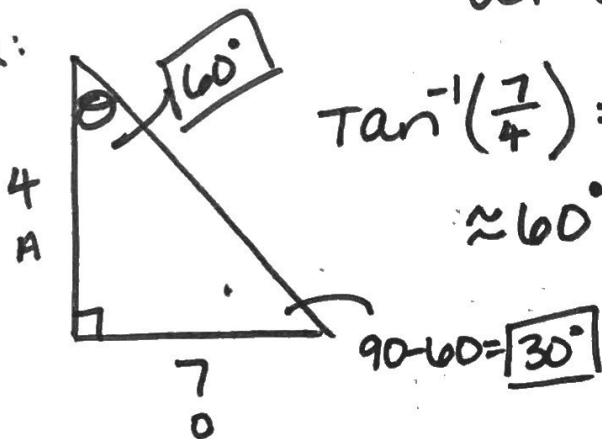
$$\sin 30 = \frac{4}{X}$$

$$X = \frac{4}{\sin 30} \approx \boxed{6.81}$$

$S^{\circ -1} H C^A -1 H T^{\circ -1} A$
(inverse)

- use when looking for an angle & we have at least 2 sides.

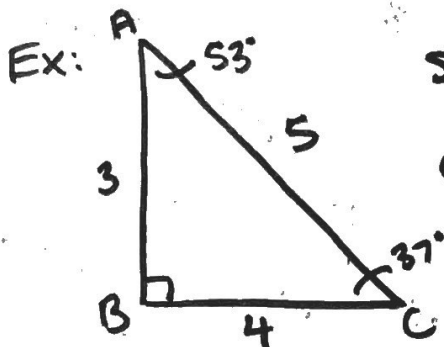
EX:



$$\tan^{-1}\left(\frac{7}{4}\right) = \approx 60^{\circ}$$

• Sine/Cosine Relationships

- The sine of one acute \angle is = to the cosine of the other acute \angle .



$$\sin A = \frac{4}{5}$$

$$\cos C = \frac{4}{5}$$

$$\cos 37 = \sin 53$$

* always complementary