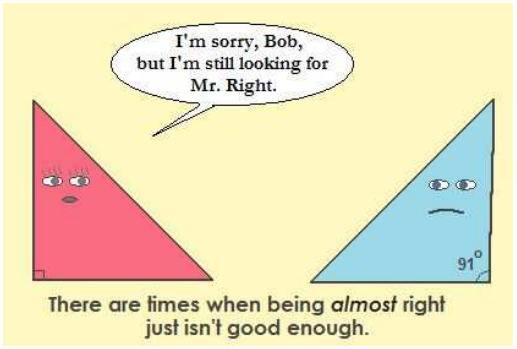
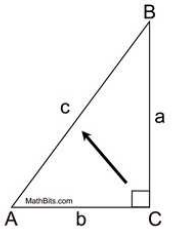
Right Triangles Summary



1. **Pythagorean Theorem**:
   Use when you know 2 sides OF A RIGHT TRIANGLE
   Asked to find the length of 3rd side.

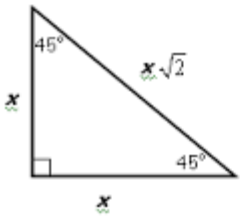


$a^2 + b^2 = c^2$
c must be hypotenuse.

Triples: 3, 4, 5
5, 12, 13
7, 24, 25
8, 15, 17

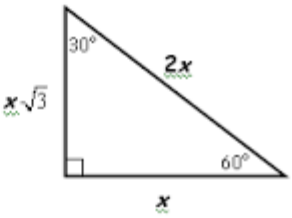
2. **Special Right Triangles**

45	45	90
x	x	$x\sqrt{2}$



Backwards ÷ $\sqrt{2}$ then rationalize

- Look for 45, 45, 90 in a square with a diagonal



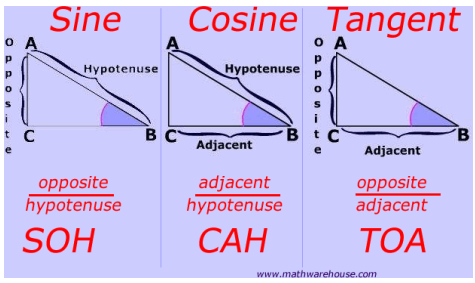
30	60	90
x	$x\sqrt{3}$	2x

Backwards ÷ $\sqrt{3}$ then rationalize

- Look for 30, 60, 90 in an equilateral triangle with altitude, rhombus with 60° or 120° angle, isosceles triangle with 120° angle

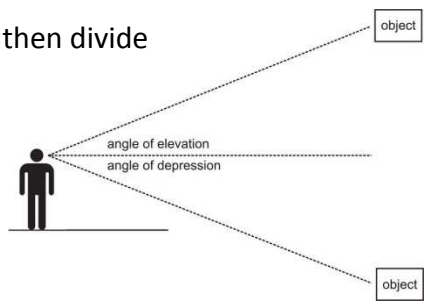
Rationalizing means to multiply numerator and denominator by $\sqrt{\ }$.
You do that when there is a radical in the denominator.

3. **Trigonometry** $S\frac{O}{H}C\frac{A}{H}T\frac{O}{A}$
   - Use when you know 2 or 3 sides OF A RIGHT TRIANGLE
     - asked to find the measure of an acute angle. ($\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$)
   - Use when you know 1 side and 1 angle OF A RIGHT TRIANGLE
     - asked to find another side



Finding a side:
x in numerator: cross multiply
x in denominator: cross multiply then divide

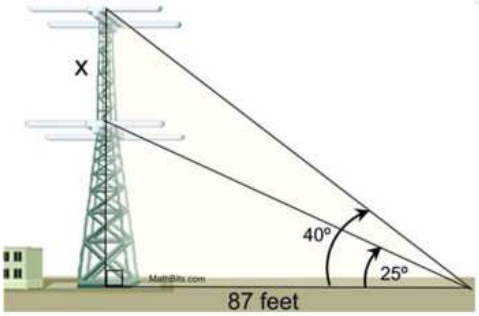
Finding an angle:
Use 2nd sin ($\sin^{-1}$)
2nd cos ($\cos^{-1}$)
2nd tan ($\tan^{-1}$)



4. Double Right Triangles

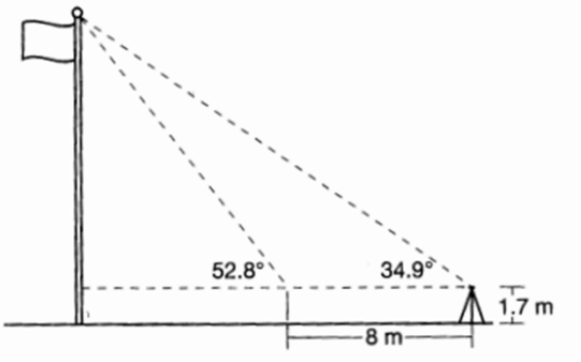
Case 1: YOU HAVE A FULL SIDE OF A RIGHT TRIANGLE

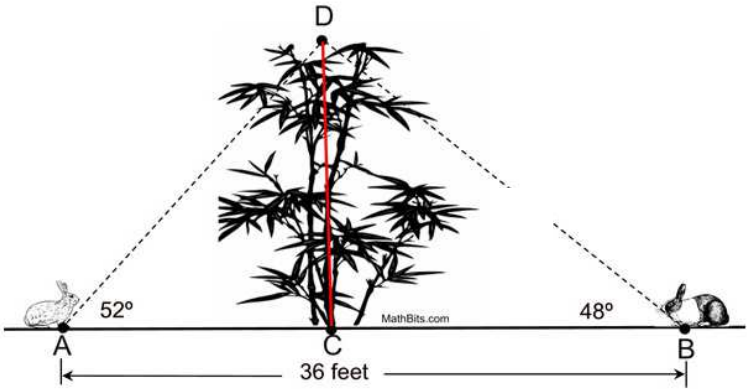
Use 2 right triangles (the small one and the whole) and then SUBTRACT LENGTHS



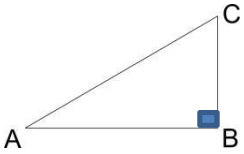
Case 2: You do not have ANY full sides of a right triangle

- In NON-RIGHT TRIANGLE, use law of sines to find side of the right triangle
  - Find all angles 1st (use linear pairs and triangles)
  - $\frac{a}{\sin A} = \frac{b}{\sin B}$
- Now that you have a side of the RIGHT TRIANGLE, hop into the right triangle and use $\boldsymbol{S\frac{O}{H}C\frac{A}{H}T\frac{O}{A}}$ to find the final answer that you are looking for.





5. **Cofunctions** sin and cos have EQUAL VALUES when angles are COMPLEMENTARY (add to 90)



sin A = cos C

cos A = sin C

If x is part of the angle: Add to 90

If x is part of the value of the function: Set =