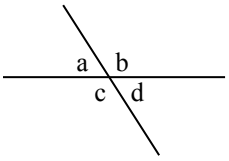
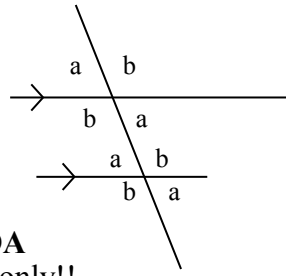
Trigonometry for Physics

Triangle Properties
The 3 angles of a triangle add up to 180º.
A right triangle has a 90º angle.
An isosceles triangle has 2 sides and angles that are equal.
An equilateral triangle has 3 angles the same (60º) and 3 sides the same.

Supplementary Angles
The angle of a straight line is 180º.
Supplementary angles add to 180º.
$a + b = 180º$ $c + d = 180º$
$a + c = 180º$ $b + d = 180º$



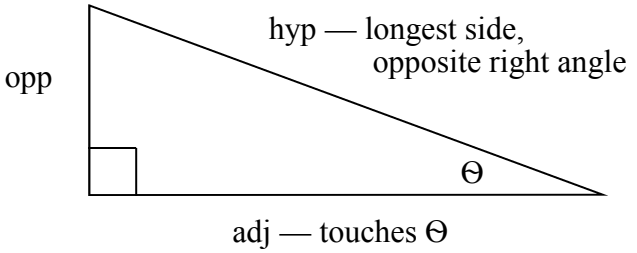
Z Rule
a's are equal
b's are equal



SOH CAH TOA
Right triangles only!!

$\sin\Theta = \frac{opp}{hyp}$ $\cos\Theta = \frac{adj}{hyp}$ $\tan\Theta = \frac{opp}{adj}$

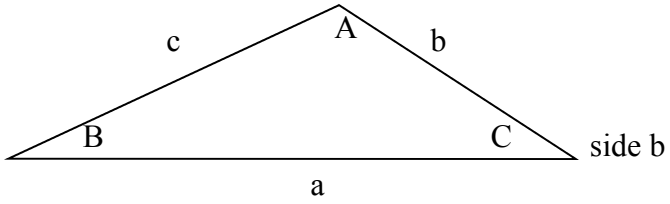
Can rearrange these to find adj, opp or hyp



Pythagorean Theorem
$hyp^2 = adj^2 + opp^2$

or $c^2 = a^2 + b^2$ where c is the hypotenuse

Cosine Law
For triangles that are not right triangles
Large A B C are angles
Small a b c are sides — side a is across from A, across from B Etc.



$a^2 = b^2 + c^2 - 2bc\cos A$
$b^2 = a^2 + c^2 - 2ac\cos B$
$c^2 = a^2 + b^2 - 2ab\cos C$
Can be rearranged for the angles.

Sine Law $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ or $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Quadratic Formula
For $ax^2 + bx + c$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$