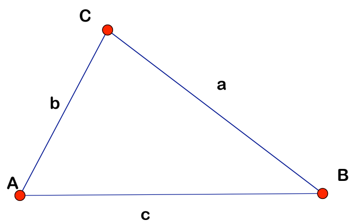
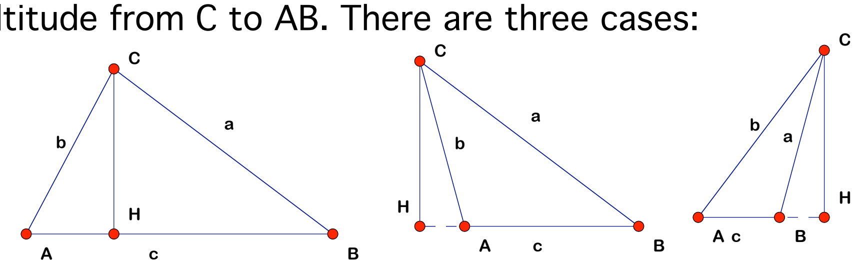
Theorem 56 (cos theorem). In a $\triangle ABC$, $|AB|=c$, $|AC|=b$ and $|BC|=a$. Then

$$a^2=c^2+b^2-2cb\cdot\cos\angle A$$



Proof:

Draw altitude from C to AB. There are three cases:



1. $|CH|=b\cdot\sin\angle A$ in all three cases. $|AH|=b\cdot\cos\angle A$ in the first and the third case and $|AH|=-b\cdot\cos\angle A$ in the second case.	1. From definition od sin and cos. In the second case the angle is $>90^\circ$ and cos is negative.
2. In the first case $|HB|=c-b\cdot\cos\angle A$, in the second case $|HB|=c+-b\cdot\cos\angle A=c-b\cdot\cos\angle A$, in the third case $|HB|=b\cdot\cos\angle A-c$	2. Follows from pictures.
3. $|HB|=|c-b\cdot\cos\angle A|$	3. Follows from 2.
4. $a^2=|CH|^2+|HB|^2=b^2\cdot\sin^2\angle A+(c-b\cdot\cos\angle A)^2=$ $b^2\cdot\sin^2\angle A+b^2\cdot\cos^2\angle A-2bc\cdot\cos\angle A+c^2=$ $b^2(\sin^2\angle A+\cos^2\angle A)+c^2-2bc\cdot\cos\angle A=$ $b^2+c^2-2bc\cdot\cos\angle A$	4. Pythogoryan Theorem