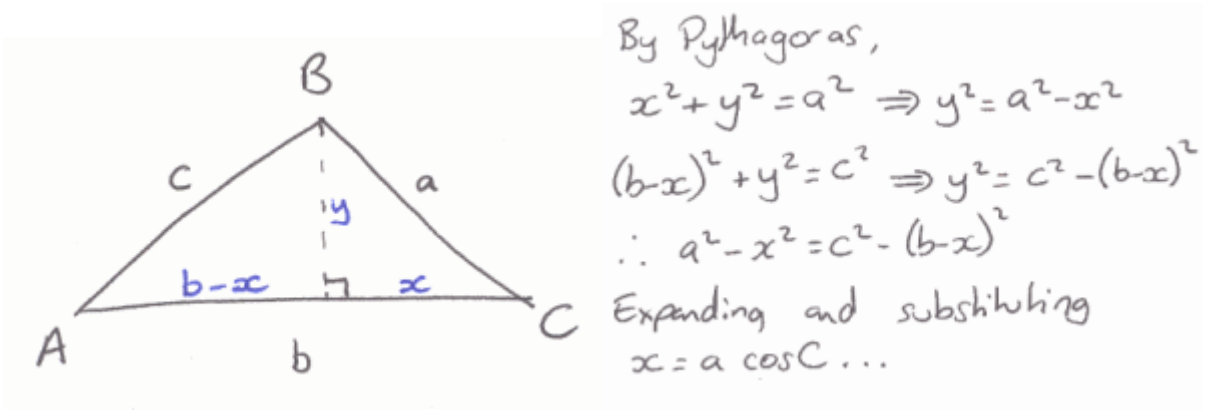
Calculating with Cosines

How can you work out the missing length of a triangle if you know the length of two sides and the angle between them?

Here is Student 1's attempt to find a formula for side c, if sides a and b and angle C are known:



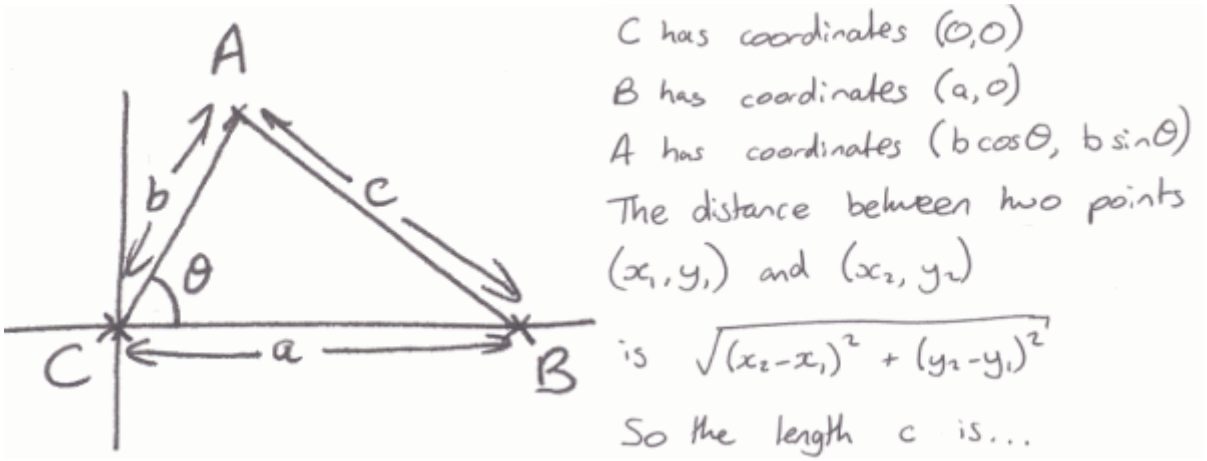
Can you make sense of what they have done?

Can you complete their method to create a formula?

Calculating with Cosines

How can you work out the missing length of a triangle if you know the length of two sides and the angle between them?

Here is Student 2's attempt to find a formula for side c, if sides a and b and angle C are known:



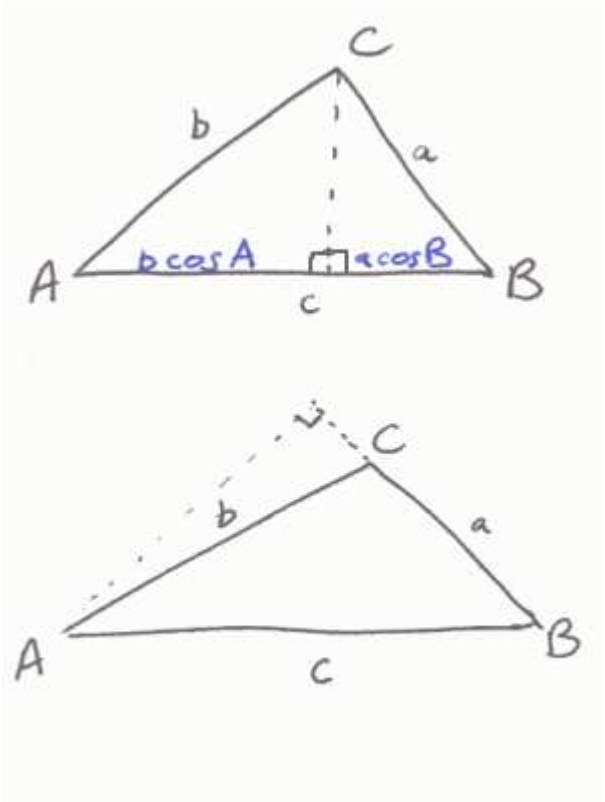
Can you make sense of what they have done?

Can you complete their method to create a formula?

Calculating with Cosines

How can you work out the missing length of a triangle if you know the length of two sides and the angle between them?

Here is Student 3's attempt to find a formula for side c, if sides a and b and angle C are known:



$c = b\cos A + a\cos B$

$\therefore c^2 = bc\cos A + ac\cos B.$

$a = c\cos B - b\cos(180° - C)$

$= c\cos B + b\cos C$

$\therefore a^2 = ac\cos B + ab\cos C$

Similarly,

$b^2 = ab\cos C + bc\cos A.$

$\therefore \quad a^2 + b^2 = \ldots$

Can you make sense of what they have done?

Can you complete their method to create a formula?