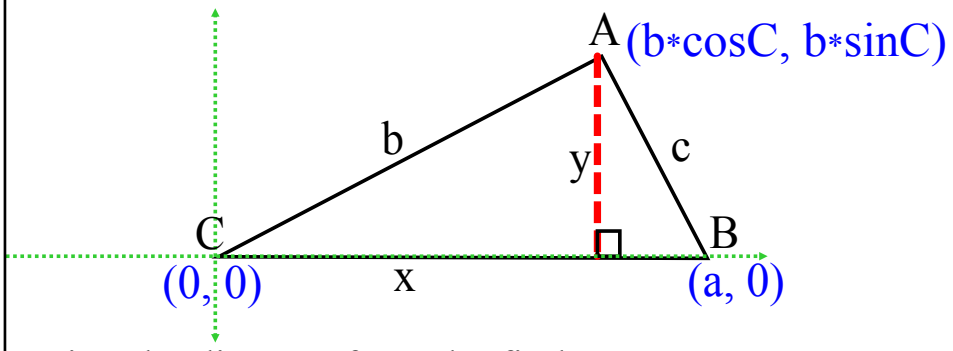
## 5.6 Law of Cosines




using the distance formula, find c.

$$c^2 = (b\cos C - a)^2 + (b\sin C - 0)^2$$

## Law of Cosines

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$$c^2 = b^2 + a^2 - 2ab\cos C$$
$$b^2 = a^2 + c^2 - 2ac\cos B$$
$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$(side\ opp\ \measuredangle)^2 = (adj\ side)^2 + (adj\ side)^2 - 2(adj\ side)(adj\ side)\cos\measuredangle$$

use w/ SSS or SAS

or w/ SSA using quad formula

Solve the triangle: a = 11 b = 5 C = 20°

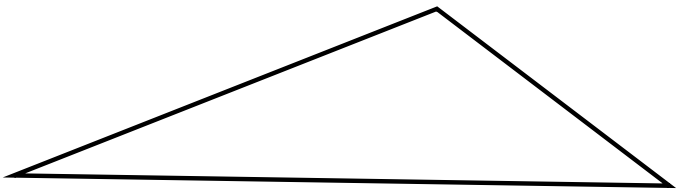
Solve the triangle:

a = 19
b = 24
c = 27

$$\measuredangle = \cos^{-1}\left(\frac{opp^2 - adj^2 - adj^2}{-2(adj)(adj)}\right)$$

$$\measuredangle = \cos^{-1}\left(\frac{adj^2 + adj^2 - opp^2}{2(adj)(adj)}\right)$$

Area of a triangle



Heron's Formula

For any triangle ABC with sides a, b, c the semiperemter is:

$$s = \frac{a+b+c}{2}$$

The area of that triangle can be found using heron's formula:

$$area : \sqrt{s(s-a)(s-b)(s-c)}$$

Find the area of the triangle with side lengths a = 13, b = 15, c = 18

Is it a triangle?

a = 8.2, b = 12.5, c = 28