

LAW OF COSINES

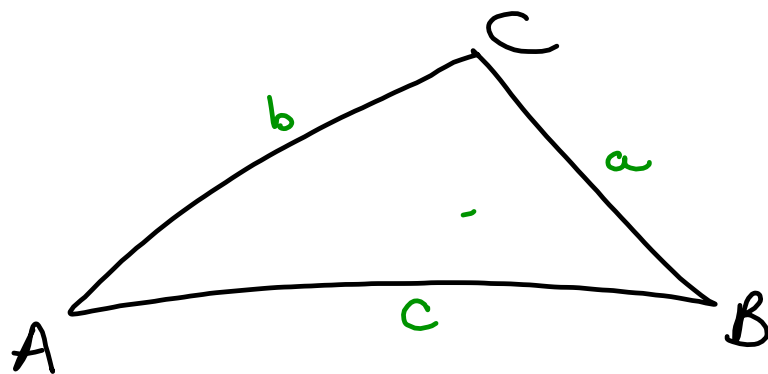
OBLIQUE TRIANGLES - NOT A
Right



SOLVE the triangle

- find all sides

- find all angles



$\angle A, \angle B, \angle C$
Capital
angles

$$A + B + C = 180^\circ$$
$$a + b + c = ?$$

a, b, c
Lower case
sides

$$a = \sqrt{b^2 + c^2 - 2bc \cos A}$$

$$b = \sqrt{a^2 + c^2 - 2ac \cos B}$$

$$c = \sqrt{a^2 + b^2 - 2ab \cos C}$$

SAS

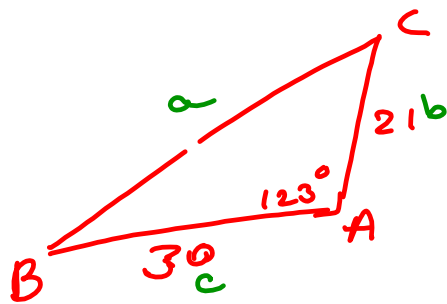
$$A = \cos^{-1} \left(\frac{b^2 + c^2 - a^2}{2bc} \right)$$

$$B = \cos^{-1} \left(\frac{a^2 + c^2 - b^2}{2ac} \right)$$

$$C = \cos^{-1} \left(\frac{a^2 + b^2 - c^2}{2ab} \right)$$

} SSS

(EX1) Find BC

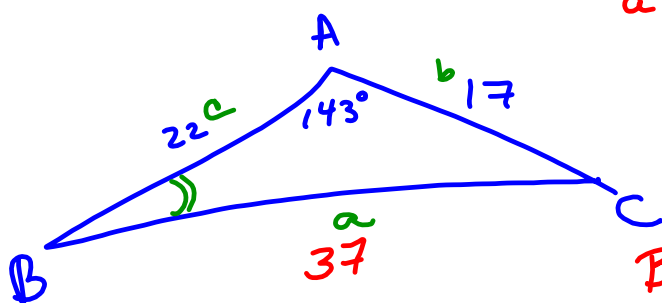


$$a = \sqrt{b^2 + c^2 - 2bc \cos A}$$

$$a = \sqrt{21^2 + 30^2 - 2(21)(30)\cos 123}$$

$$a = 45.0$$

EX2 Find $m\angle B$



$$a = \sqrt{17^2 + 22^2 - 2 \cdot 17 \cdot 22 \cos(143^\circ)}$$

$$a = 37$$

$$B = \cos^{-1} \left(\frac{(37^2 + 22^2 - 17^2)}{(2 \cdot 37 \cdot 22)} \right)$$

$$m\angle B = 16.1^\circ$$