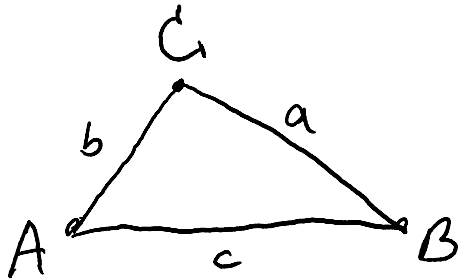


Section 7.2: Law of Cosines

Monday, September 22, 2014
1:18 PM

Goal: To solve triangles using the law of Cosines

Law of Cosines



$$\textcircled{1} \quad c^2 = a^2 + b^2 - 2ab \cos C$$

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

$$\textcircled{3} \quad b^2 = a^2 + c^2 - 2ac \cos B$$

Two situations to use Law of Cosines

SSS

SAS

ex solve the triangle (SSS)

$$a = 8, b = 19, c = 14$$

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

$$19^2 = 8^2 + 14^2 - 2(8)(14) \cos B$$

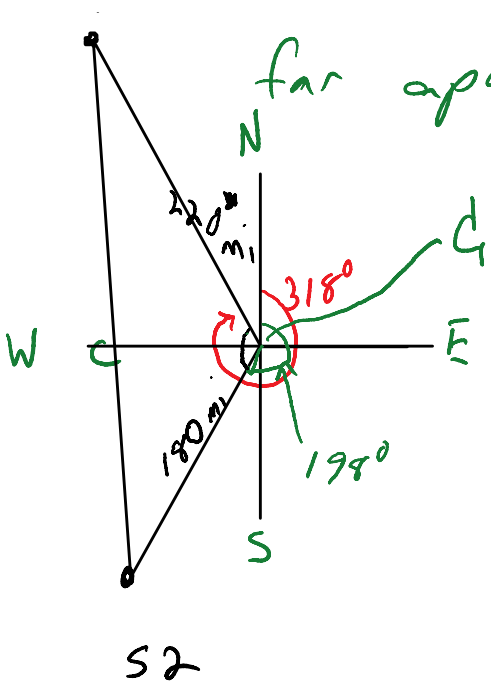
$$\cos^{-1} \left(\frac{19^2 - 8^2 - 14^2}{-2(8)(14)} \right) = \cos^{-1}(\cos B)$$

$$B \approx 116.8^\circ$$

Use Law of sines to find next angle.

(ex) One ship travels 220 miles at a heading of 318° . Another ship travels 180 miles at 198° . If they ~~leave~~^{left} the same port at the same time, how far apart are they?





$$C = 318^\circ - 198^\circ = 120^\circ$$

SAS

$$\sqrt{c^2} = \sqrt{220^2 + 180^2 - 2 \cdot 220 \cdot 180 \cos 120^\circ}$$

$$\approx 347 \text{ mi}$$