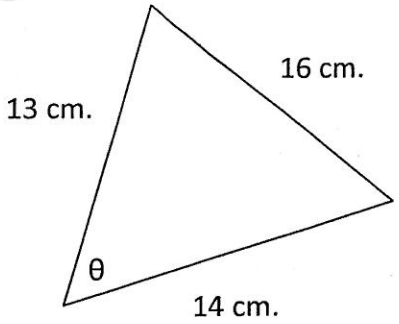
*AAT

Chapter 8: Law of Sines/Cosines (IC)

Name: Key

Date: _____ Period: _____

Use the law of cosines to determine the value of θ.

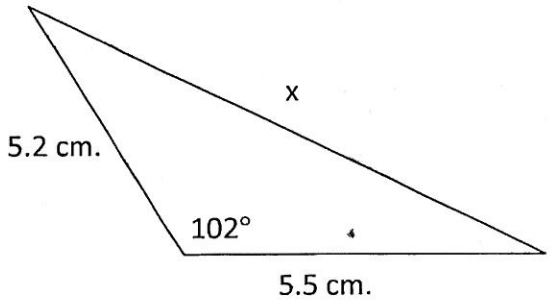


$16^2 = 13^2 + 14^2 - 2(13)(14)\cos\theta$

$\frac{16^2 - 13^2 - 14^2}{(-2 \cdot 13 \cdot 14)} = \cos\theta$

$72.57° \approx \theta$

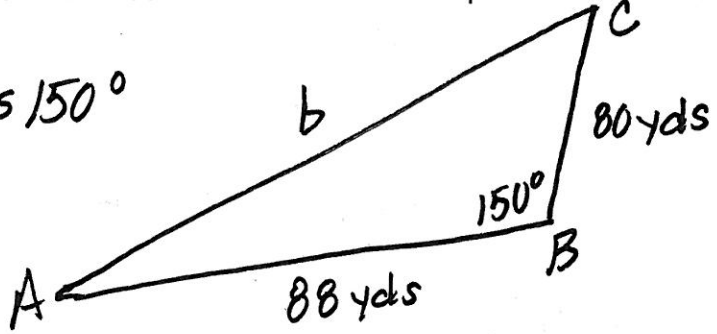
2. Use the law of cosines to determine the value of x.



$x^2 = 5.2^2 + 5.5^2 - 2(5.2)(5.5)\cos 102$

$x \approx 8.3\text{cm}$

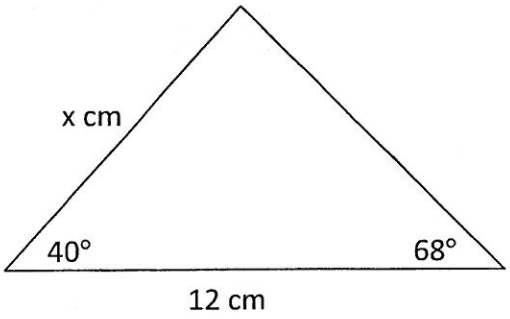
3. Lifeguard stands are set up on the beach with 88 yards between stands A and B and 80 yards between stands B and C. The stands make an angle of 150° at vertex B. A buoy line needs to be set up from lifeguard stand A to lifeguard stand C to mark a division between more shallow and deeper waters. About how long must the buoy line be?



$b^2 = 80^2 + 88^2 - 2(80)(88)\cos 150°$

$b = 162.29 \text{ yds.}$

4. Use the law of sines to determine the value of x

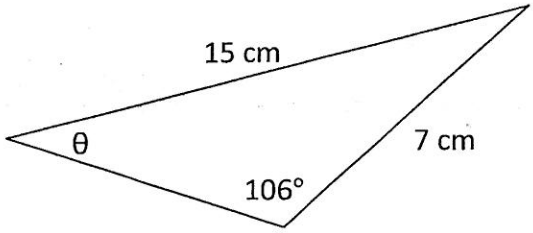


$$\frac{\sin 68}{x} = \frac{\sin 72}{12}$$

$$\frac{12 \sin 68}{\sin 72} = \frac{x \sin 72}{\sin 72}$$

$x \approx 11.7\text{ cm}$

5. Use the law of sines to determine the value of θ.

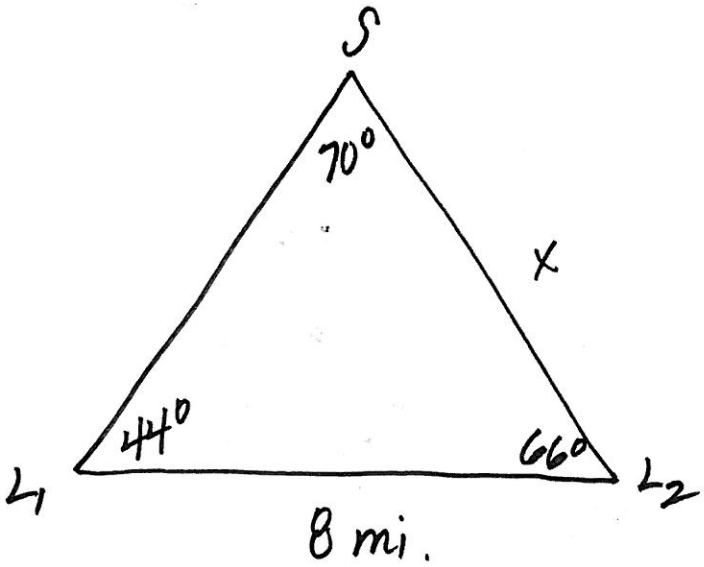


$$\frac{\sin\theta}{7} = \frac{\sin 106}{15}$$

$$\frac{7 \sin 106}{15} = \frac{15 \sin\theta}{15}$$

$26.65° = \theta$

6. A disable ship (at point S) is sighted from two different lighthouses that are 8 miles apart (at points L_1 and L_2). If $m\angle SL_1L_2 = 44°$ and $m\angle SL_2L_1 = 66°$, find the distance from the ship to the nearest lighthouse.



$$\frac{\sin 70}{8} = \frac{\sin 44}{x}$$

$$x = \frac{8 \sin 44}{\sin 70}$$

$x \approx 5.9\text{ m}$