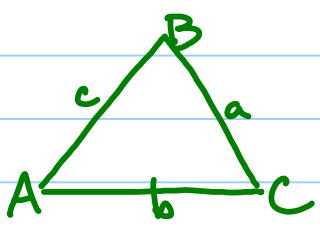


Recap of 6.1

6.2 Law of Cosines
SSS & SAS

AAS, ASA → 1 soln
SSA → 0, 1, or 2 solns



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

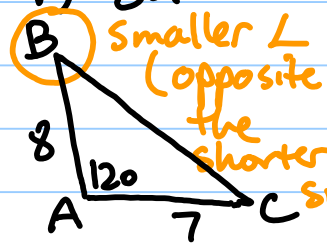
$$b^2 = a^2 + c^2 - 2ac \cos B$$

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

* Solve for the shorter sides & angles

ex 1) Solve the Δ given $A=120^\circ, b=7, c=8$

SAS



Smaller \angle (opposite the shorter side)

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

$$a^2 = 7^2 + 8^2 - 2(7)(8) \cos 120^\circ$$

$$a = \sqrt{\dots} = 13$$

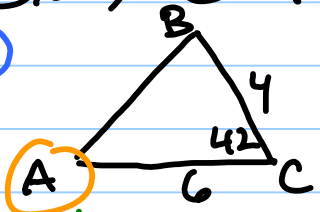
~~$b^2 = a^2 + c^2 - 2ac \cos B$~~
 ~~$7^2 = 13^2 +$~~ or Law of Sines $\frac{13}{\sin 120} = \frac{7}{\sin B}$

$$B = \sin^{-1}\left(\frac{7 \sin 120}{13}\right) = 28^\circ$$

$$m\angle C = 180 - (120 + 28) = 32^\circ$$

ex 2) $C=42^\circ, a=4, b=6$

SAS



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

$$c = \sqrt{4^2 + 6^2 - 2(4)(6) \cos 42^\circ}$$

$$c = 4.04$$

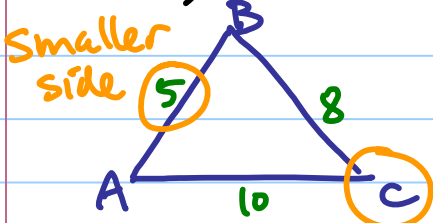
$$\frac{4.04}{\sin 42} = \frac{4}{\sin A}$$

$$A = \sin^{-1}\left(\frac{4 \sin 42}{4.04}\right) \approx 41^\circ$$

$$m\angle B = 180 - (42 + 41)$$

$$B = 97^\circ$$

ex 3) $a=8, b=10, c=5$



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

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

Smaller angle

$$\cos^{-1}\left(\dots\right) = C = 30^\circ$$

$$\cos^{-1}\left(\frac{5^2 - 8^2 - 10^2}{-2(8)(10)}\right)$$

$$\frac{5}{\sin 30} = \frac{8}{\sin A}$$

$$A = \sin^{-1}\left(\frac{8 \sin 30}{5}\right) = 52^\circ$$

$$B = 180 - (30 + 52) = 98^\circ$$

Area of a $\Delta \rightarrow$ SSS

Heron's Formula

$$A = \sqrt{s(s-a)(s-b)(s-c)} \quad s = \frac{1}{2}(a+b+c)$$

ex 4) Find the area of the Δ : $a=6, b=16, c=18$

$$s = \frac{1}{2}(6+16+18) = \frac{1}{2}(40) = 20$$

$$A = \sqrt{20(20-6)(20-16)(20-18)} = \sqrt{20(14)(4)(2)}$$

$$A = 47.32 \text{ units}^2$$

Hw p 661 #2-30 even