

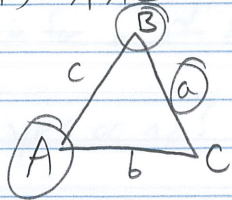
12-1

## Law of Sines

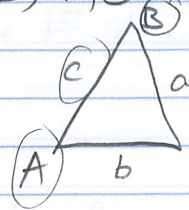
Hw ✓; Go over tests

Law of Cosines: SSS or SAS (No letter repeat for either)

Law of Sines: 1) AAS

(still for  
oblique  $\Delta$ 's)

2) ASA

How do we find  
this?  $180 - A - B = C$ 

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{Pick 2 of them.}$$

Ex 1: In  $\Delta ABC$ ,  $m\angle B = 64^\circ$ ,  $m\angle C = 38^\circ$ ,  $b = 9$  ft  
Solve the  $\Delta$  (Find all missing pieces)

$$\begin{array}{lll} A = 78^\circ & a = 9.79 \text{ ft} & A = 180 - 64 - 38 = 78^\circ \\ B = 64^\circ & b = 9 \text{ ft} & \\ C = 38^\circ & c = 6.16 \text{ ft} & \end{array}$$

$$\begin{aligned} \text{a) } \frac{\sin A}{a} &= \frac{\sin B}{b} \\ \frac{\sin 78^\circ}{a} &= \frac{\sin 64^\circ}{9} \\ a \sin 64^\circ &= 9 \sin 78^\circ \\ a &= \frac{9 \sin 78^\circ}{\sin 64^\circ} \\ a &= 9.79 \text{ ft.} \end{aligned}$$

$$\begin{aligned} \text{c) } \frac{\sin B}{b} &= \frac{\sin C}{c} \\ \frac{\sin 64^\circ}{9} &= \frac{\sin 38^\circ}{c} \\ c \sin 64^\circ &= 9 \sin 38^\circ \\ c &= \frac{9 \sin 38^\circ}{\sin 64^\circ} \\ c &= 6.16 \text{ ft} \end{aligned}$$

Reasonable?

Ex 2: In  $\Delta ABC$ ,  $a = 8$  m,  $B = 47^\circ$ ,  $C = 65^\circ$

$$\begin{array}{lll} A = 68^\circ & a = 8 \text{ m} & A = 180 - 47 - 65 = 68^\circ \\ B = 47^\circ & b = 6.31 \text{ m} & \\ C = 65^\circ & c = 7.82 \text{ m} & \end{array}$$

$$\begin{aligned} \text{b) } \frac{\sin A}{a} &= \frac{\sin B}{b} \\ \frac{\sin 68^\circ}{8} &= \frac{\sin 47^\circ}{b} \\ b \sin 68^\circ &= 8 \sin 47^\circ \\ b &= \frac{8 \sin 47^\circ}{\sin 68^\circ} \end{aligned}$$

$$\begin{aligned} \text{c) } \frac{\sin A}{a} &= \frac{\sin C}{c} \\ \frac{\sin 68^\circ}{8} &= \frac{\sin 65^\circ}{c} \\ c \sin 68^\circ &= 8 \sin 65^\circ \\ c &= \frac{8 \sin 65^\circ}{\sin 68^\circ} \end{aligned}$$

Reasonable?