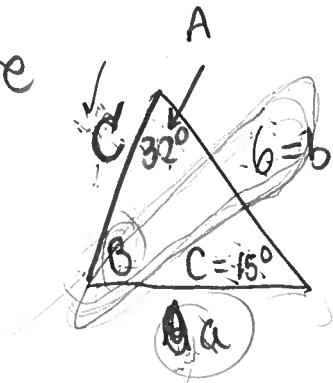
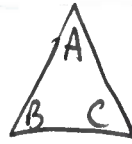


Ex: Solve



$$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$$

(1)



$$A + B + C = 180^\circ$$

Find B

$$32^\circ + B + 15^\circ = 180^\circ$$

$$B + 47^\circ = 180^\circ$$

$$B = 133^\circ$$

Find C

$$\frac{\sin(133^\circ)}{6} = \frac{\sin(15^\circ)}{c}$$

Reciprocal

Find a

$$\frac{\sin(133^\circ)}{6} = \frac{\sin(32^\circ)}{a}$$

$$\frac{6}{\sin(133^\circ)} = \frac{c}{\sin(15^\circ)}$$

number →

Mult by $\sin(15^\circ)$

$$\frac{6}{\sin(133^\circ)} = \frac{a}{\sin(32^\circ)}$$

$$2.12 \approx \frac{6 \sin(15^\circ)}{\sin(133^\circ)} = c$$

$$4.35 \approx \frac{6 \sin(32^\circ)}{\sin(133^\circ)} = a$$

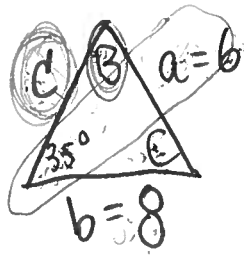
~~AAS~~

~~SAAT~~

ASA

Ex: Solve

8 8
8



$$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c} \quad (2)$$

Find B

$$\frac{\sin(35^\circ)}{6} = \frac{\sin(B)}{8}$$

$$\frac{8\sin(35^\circ)}{6} = \sin(B)$$

⇓ plug into arcsin

$$B = \arcsin\left(\frac{8\sin(35^\circ)}{6}\right) \approx 49.89^\circ$$

MAGIC

to find 2nd soln ~ consider

$$B_2 = 180^\circ - B$$



this is not the only way to answer this problem
↓
LATER

Find C

$$35^\circ + 49.89^\circ + C = 180^\circ$$

$$C = 180^\circ - 35^\circ - 49.89^\circ = 95.11^\circ$$

Find c

$$\frac{\sin(95.11^\circ)}{c} = \frac{\sin(35^\circ)}{6}$$

$$\frac{c}{\sin(95.11^\circ)} = \frac{6}{\sin(35^\circ)}$$

$$c = \frac{6\sin(95.11^\circ)}{\sin(35^\circ)} \approx 10.42$$

2nd solution of the problem

(3)

$$\begin{aligned} B_2 &= 180^\circ - B \\ &= 180^\circ - 49.89^\circ = 130.11^\circ \end{aligned}$$

Find C_2

$$35^\circ + 130.11^\circ + C_2 = 180^\circ$$

$$\begin{aligned} C_2 &= 180^\circ - 35^\circ - 130.11^\circ \\ &= 14.89^\circ \end{aligned}$$

Find c_2

$$\frac{\sin(14.89^\circ)}{c_2} = \frac{\sin(35^\circ)}{6}$$

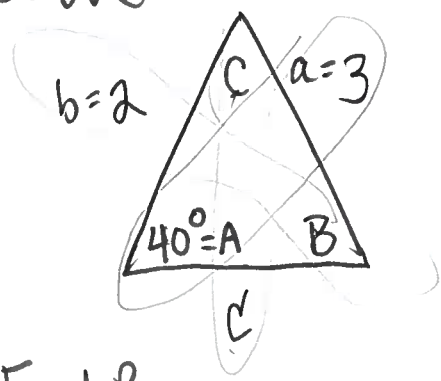
$$\frac{c_2}{\sin(14.89^\circ)} = \frac{6}{\sin(35^\circ)}$$

$$c_2 = \frac{6 \sin(14.89^\circ)}{\sin(35^\circ)} \approx 2.69$$

MORAL: if you use arcsin in a law of sines ^{to find angle X} then always consider 2nd solution by considering

$$X_2 = 180^\circ - X$$

Ex: Solve



Find B

$$\frac{\sin(B)}{2} = \frac{\sin(40^\circ)}{3}$$

$$\sin(B) = \frac{2\sin(40^\circ)}{3}$$

$$B = \arcsin\left(\frac{2\sin(40^\circ)}{3}\right) \approx 25.37^\circ$$

Find C

$$40^\circ + C + 25.37^\circ = 180^\circ$$

$$C = 180^\circ - 40^\circ - 25.37^\circ = 114.63^\circ$$

Find c

$$\frac{\sin(40^\circ)}{3} = \frac{\sin(114.63^\circ)}{c}$$

$$c = \frac{3\sin(114.63^\circ)}{\sin(40^\circ)}$$

$$\approx 4.24$$

2nd soln?

B₂

$$B_2 = 180^\circ - B = 180^\circ - 25.37^\circ = 154.63^\circ$$

Find C₂

$$40^\circ + 154.63^\circ + C_2 = 180^\circ$$

$$C_2 = 180^\circ - 40^\circ - 154.63^\circ = -14.63^\circ$$

too big... > 180°

???

No 2nd soln