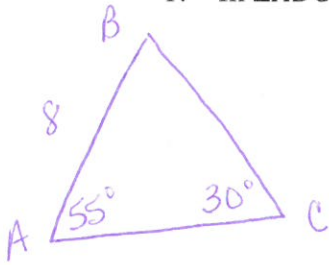


Section 6-4 Law of Sines

1. In  $\triangle ABC$ ,  $c = 8$ ,  $A = 55^\circ$ ,  $C = 30^\circ$ . Find  $a$  and  $b$ .



$$m\angle B = 180 - (55 + 30) \quad m\angle B = 95^\circ$$

$$\frac{\sin 95}{b} = \frac{\sin 30}{8} \quad | \quad \frac{\sin 55}{a} = \frac{\sin 30}{8}$$

$$8 \cdot \sin 95 = b \sin 30 \quad | \quad 8 \cdot \sin 55 = a \cdot \sin 30$$

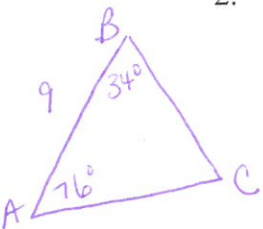
$$b = \frac{8 \cdot \sin 95}{\sin 30} \quad \boxed{b \approx 15.94} \quad | \quad a = \frac{8 \cdot \sin 55}{\sin 30} \quad \boxed{a \approx 13.11}$$

\* Must have an angle and the side opp. that angle (angle-side pair) to use the Law of Sines.

**Law of Sines**

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} \quad \text{and} \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

2. In  $\triangle ABC$ ,  $A = 76^\circ$ ,  $B = 34^\circ$ ,  $c = 9$ . Find  $a$  and  $b$ .



$$m\angle C = 70^\circ$$

$$\frac{\sin 70}{9} = \frac{\sin 76}{a}$$

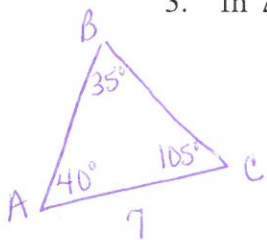
$$\frac{\sin 70}{9} = \frac{\sin 34}{b}$$

$$\boxed{a \approx 9.29}$$

$$\boxed{b \approx 5.36}$$

\* Smallest side across from smallest  $\angle$ , and so on.

3. In  $\triangle ABC$ ,  $B = 35^\circ$ ,  $C = 105^\circ$ ,  $b = 7$ . Find  $a$  and  $c$ .



$$\frac{\sin 35}{7} = \frac{\sin 40}{a}$$

$$\frac{\sin 35}{7} = \frac{\sin 105}{c}$$

$$a = \frac{7 \cdot \sin 40}{\sin 35}$$

$$c = \frac{7 \cdot \sin 105}{\sin 35}$$

$$\boxed{a \approx 7.84}$$

$$\boxed{c \approx 11.79}$$