

Show work on your own paper.

**Remember**

**The Law of Sines:** In any triangle, the sides are proportional to the sines of the opposite angles.

$$\text{In } \triangle ABC: \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

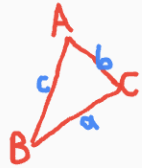
Sketch a triangle with the given measurements. Then use the Law of Sines to find the missing length.

1. In  $\triangle ABC$ ,  $m\angle A = 72^\circ$ ,  $m\angle B = 40^\circ$ , and  $c = 15$  inches.  
Find the length of side  $a$ , to the nearest tenth of an inch.

$$a = 15.4 \text{ in.}$$

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

$$72^\circ + 40^\circ + m\angle C = 180^\circ \quad \text{So, } m\angle C = 68^\circ$$



$$\frac{15}{\sin 68^\circ} = \frac{a}{\sin 72^\circ}$$

$$a = \frac{15 \cdot \sin 72^\circ}{\sin 68^\circ} = \frac{15 \cdot .95106}{.92718}$$

$$a \approx 15.4$$

2. In  $\triangle ABC$ ,  $m\angle B = 38^\circ$ ,  $m\angle C = 56^\circ$ , and  $a = 12$  meters.  
Find the length of side  $b$ , to the nearest tenth of a meter.

3. In  $\triangle ABC$ ,  $m\angle A = 44^\circ$ ,  $a = 15$  units,  $b = 28$  units.  
Find  $m\angle B$ , to the nearest degree.

4. On an architectural blueprint, the measures of two angles of a triangle are  $25^\circ$  and  $58^\circ$ . The shortest side of the triangle is 17 centimeters. Find the length of the longest side, to the nearest centimeter.

5. In  $\triangle PQR$ ,  $m\angle P = 40^\circ$ ,  $p = 24$  inches, and  $q = 10$  inches.  
Find  $m\angle Q$ , to the nearest degree.

6. The Vietnam Veterans Memorial in Washington, D.C. is composed of two walls, each 246 ft 9 in. long, which meet at an angle of  $125.2^\circ$ . Find the distance between the ends of the walls that do not meet, to the nearest foot.

7. In  $\triangle ABC$ ,  $m\angle A = 30^\circ$ ,  $a = 15$  in., and  $b = 20$  in.  
Find  $m\angle B$ , to the nearest degree.