

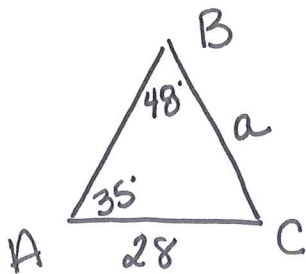
Name: Key

Hr: _____

Law of Sines Homework

Directions: Find the missing variable.

1. If $m\angle A = 35$, $m\angle B = 48$, and $b = 28$, find a .

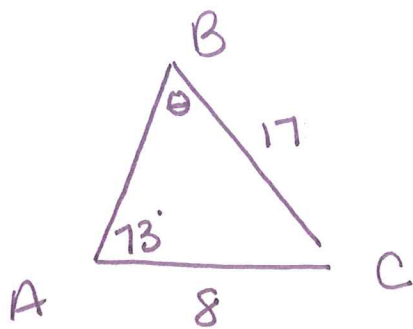


$$\frac{\sin(35)}{a} = \frac{\sin(48)}{28}$$

$$28 \cdot \sin(35) = \frac{a \sin(48)}{\sin(48)}$$

$$a \approx 21.61$$

2. If $a = 17$, $b = 8$, and $m\angle A = 73$, find $m\angle B$.



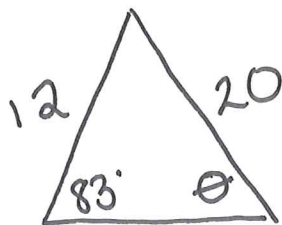
$$\frac{\sin B}{8} = \frac{\sin(73)}{17}$$

$$\sin B = \frac{8 \sin(73)}{17}$$

$$\angle B = \sin^{-1}\left(\frac{8 \sin(73)}{17}\right)$$

$$\angle B \approx 26.75^\circ$$

3. In a scalene triangle, one side is 12 feet and another side is 20 feet. The angle opposite 20 feet is 83 degrees. Find the measure of the angle opposite the side that is 12 feet.

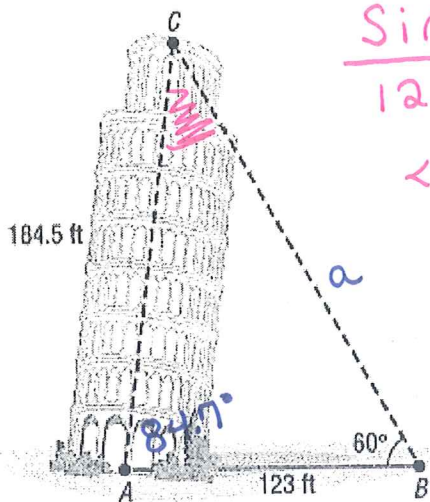


$$\frac{\sin \theta}{12} = \frac{\sin(83)}{20}$$

$$\theta = \sin^{-1}\left(\frac{12 \cdot \sin(83)}{20}\right)$$

$$\theta \approx 36.55^\circ$$

4. The famous Leaning Tower of Pisa was originally 184.5 feet high. At a distance of 123 feet from the base of the tower, the angle of elevation to the top of the tower is found to be 60° . Solve the triangle and round to the nearest tenth.



$$\frac{\sin C}{123} = \frac{\sin(60)}{184.5}$$

$$C = \sin^{-1}\left(\frac{123 \sin(60)}{184.5}\right)$$

$$C = 35.3^\circ$$

$$m\angle C = 35.3^\circ$$

$$m\angle A = 84.7^\circ$$

By Δ Sum

$$\frac{\sin(84.7)}{a} = \frac{\sin(60)}{184.5}$$

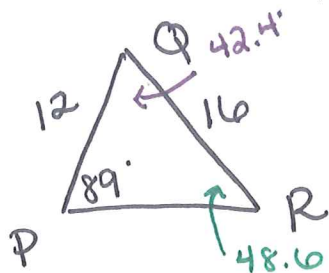
$$a = \frac{184.5 \sin(84.7)}{\sin(60)}$$

$$CB = 212.1 \text{ ft}$$

$$a \approx 212.1 \text{ ft}$$

5. SOLVE the triangle. (Triangle PQR) I rounded to the nearest tenth.

$$m\angle P = 89, p = 16, r = 12$$



Find R

$$\frac{\sin R}{12} = \frac{\sin(89)}{16}$$

$$R = \sin^{-1}\left(\frac{12 \sin(89)}{16}\right)$$

$$R = 48.6^\circ$$

$$Q = 42.4^\circ$$

By Δ Sum

$$\frac{\sin(42.4)}{q} = \frac{\sin(89)}{16}$$

$$16 \sin(42.4) = q \sin(89)$$

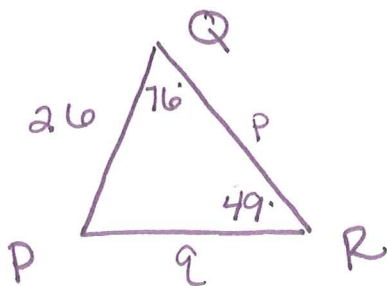
$$\frac{16 \sin(42.4)}{\sin(89)} = q$$

$$10.8 = q$$

6. SOLVE the triangle. (Triangle PQR)

$$m\angle R = 49, m\angle Q = 76, r = 26$$

$$P = 55^\circ \text{ by } \Delta \text{ Sum}$$



$$\frac{\sin(76)}{q} = \frac{\sin(49)}{26}$$

$$q = \frac{26 \cdot \sin(76)}{\sin(49)}$$

$$q = 33.4$$

$$\frac{\sin(55)}{p} = \frac{\sin(49)}{26}$$

$$p = \frac{26 \sin(55)}{\sin(49)}$$

$$p = 28.2$$