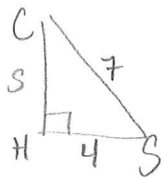


Round your answers to the nearest tenth.

1. In  $\triangle CHS$   $\angle H = 90^\circ$ ,  $c = 4$ , and  $h = 7$ . Solve the triangle.



$$s^2 + 4^2 = 7^2$$

$$s^2 = 33$$

$$s = 5.7 \text{ un}$$

$$\sin C = \frac{4}{7}$$

$$\angle C = \sin^{-1}\left(\frac{4}{7}\right) = 34.8$$

$$\begin{array}{r} 180 \\ - 34.8 \\ \hline 55.2 \end{array}$$

$$m\angle C = 34.8^\circ$$

$$m\angle S = 55.2^\circ$$

2. In  $\triangle XYZ$   $\angle Z = 37^\circ$ ,  $x = 5$ , and  $y = 6$ . Solve the triangle AND find the area.

$$z^2 = 5^2 + 6^2 - 2(5)(6)\cos(37^\circ)$$

$$z^2 = 13.0818$$

$$z = 3.6 \text{ un}$$

$$\cos Y = \frac{6^2 + 5^2 - 3.6^2}{-2(5)(3.6)} = \frac{-1.96}{-36} = .0544$$

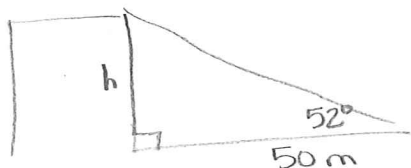
$$m\angle Y = 86.9^\circ$$

$$m\angle X = 56.1^\circ$$

$$\text{Area } K = \frac{1}{2}(5)(6)\sin 37^\circ$$

$$K = 9.0 \text{ un}^2$$

3. Standing at a distance of 50 m from a building, the angle of elevation to the top is  $52^\circ$ . Find the height of the building.



$$\tan 52^\circ = \frac{h}{50}$$

$$h = (50)(\tan 52^\circ) = 63.997 \approx 64 \text{ m}$$

Solve each triangle; round your answers to the nearest tenth.

Remember if SSA you need to determine the number of possible triangles.

4.  $a = 13.7$ ,  $A = 25.4^\circ$ ,  $B = 78^\circ$  **AAS**  
 Law of Sines

$$\frac{\sin 25.4}{13.7} = \frac{\sin 78}{b}$$

$$b = 31.2 \text{ un}$$

$$\frac{\sin 78}{c} = \frac{\sin 25.4}{13.7}$$

$$\begin{array}{r} m\angle C = 180 \\ - 25.4 \\ - 78 \\ \hline \end{array}$$

$$m\angle C = 76.6^\circ$$

$$c = 31.1 \text{ un}$$

5.  $b = 50$ ,  $a = 33$ ,  $A = 132^\circ$  **SSA**  $\rightarrow$  No, 1, or 2?

$$\frac{\sin 132}{33} = \frac{\sin B}{50}$$

$$\sin B = 1.12$$

$$\sin^{-1}(1.12) = \text{DNE}$$



NO  $\triangle$  exists

6.  $A = 38^\circ$ ,  $B = 63^\circ$ ,  $c = 15$

$$m\angle C = 79^\circ$$

$$\frac{\sin 38}{a} = \frac{\sin 79}{15}$$

$$a = 9.4 \text{ un}$$

$$\frac{\sin 63}{b} = \frac{\sin 79}{15}$$

$$b = 13.6 \text{ un}$$

7.  $a = 125$ ,  $A = 25^\circ$ ,  $b = 150$  **SSA**  $\rightarrow$  No, 1 or 2?

$$\frac{\sin 25}{125} = \frac{\sin B}{150}$$

$$\sin B = .507$$

$$m\angle B = 30.5^\circ$$

$$m\angle C = 180 - 30.5 - 25$$

$$m\angle C = 124.5^\circ$$

$$\frac{\sin 124.5}{c} = \frac{\sin 25}{125}$$

$$c = 243.0 \text{ un}$$

2  $\triangle$ ?

$$180 - 30.5 = 149.5$$

$$m\angle B = 149.5^\circ$$

$$m\angle C = 180 - 149.5 - 25$$

$$m\angle C = 5.5^\circ$$

$$\frac{\sin 25}{125} = \frac{\sin 5.5}{c}$$

$$c = 28.3 \text{ un}$$

8.  $b = 15.2, A = 12.5^\circ, C = 57.5^\circ$

$$\begin{aligned} m\angle B &= 110^\circ \\ a &= 3.5 \text{ in} \\ c &= 13.6 \text{ in} \end{aligned}$$

$$\begin{aligned} m\angle B &= 180 - A - C \\ \frac{\sin 110}{15.2} &= \frac{\sin 12.5^\circ}{a} \\ \frac{\sin 110}{15.2} &= \frac{\sin 57.5}{c} \end{aligned}$$

9.  $a = 12, b = 15, A = 55^\circ$

$$\frac{\sin 55^\circ}{12} = \frac{\sin B}{15}$$

$$\sin B = 1.02$$

$\Delta$  DNE

10.  $a = 1.5, b = 2.3, c = 1.9$

$$\cos A = \frac{1.5^2 + 2.3^2 - 1.9^2}{-2(2.3)(1.9)} = \frac{-6.65}{-8.74} = .76$$

$$m\angle A = \cos^{-1}(.7608) = 40.459$$

$$\cos B = \frac{2.3^2 + 1.5^2 - 1.9^2}{-2(1.5)(1.9)} = \frac{-5.7}{-5.7} = .1$$

$$m\angle B = \cos^{-1}(.1) = 84.26$$

$$\begin{aligned} m\angle A &= 40.5^\circ \\ m\angle B &= 84.3^\circ \\ m\angle C &= 55.2^\circ \end{aligned}$$

11.  $b = 40, c = 45, A = 51^\circ$

$$a^2 = 40^2 + 45^2 - 2(40)(45)\cos(51^\circ)$$

$$a^2 = 1359.446 \quad a = 36.9 \text{ in}$$

$$\cos B = \frac{40^2 + 45^2 - 36.9^2}{-2(45)(36.9)} = \frac{-1786.6}{-3321}$$

$$180 - A - B = .5379$$

$$m\angle C = 71.5^\circ$$

$$m\angle B = 57.5^\circ$$

SAS 12.  $A = 52^\circ, b = 120, c = 160$

$$\begin{aligned} a &= 127.9 \text{ in} \\ m\angle B &= 47.7^\circ \\ m\angle C &= 80.3^\circ \end{aligned}$$

$$a^2 = 120^2 + 160^2 - 2(120)(160)\cos 52^\circ$$

$$\begin{aligned} a^2 &= 16358.6 \\ a &= 127.9 \text{ in} \end{aligned}$$

$$\cos B = \frac{120^2 + 160^2 - 127.9^2}{2(120)(160)}$$

$$\begin{aligned} \cos B &= .6733 \\ m\angle B &= 47.67^\circ \end{aligned}$$

$$\begin{aligned} 180 \\ -52 \\ -47.7 \\ \hline m\angle C &= 80.3 \end{aligned}$$

13.  $a = 15, b = 18, c = 17$

$$\cos A = \frac{15^2 + 18^2 - 17^2}{-2(18)(17)} = \frac{-388}{-612} = .6339$$

$$m\angle A = 50.7^\circ$$

$$\cos B = \frac{18^2 + 15^2 - 17^2}{-2(15)(17)} = \frac{-190}{-510} = .3725$$

$$m\angle B = 68.1^\circ$$

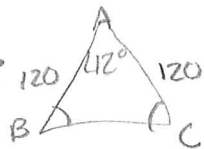
$$180 - A - B = m\angle C = 61.2^\circ$$

SAS 14.  $A = 42^\circ, b = 120, c = 120$

$$a^2 = 120^2 + 120^2 - 2(120)(120)\cos 42^\circ$$

$$a^2 = 7397.429$$

$$a = 86 \text{ in}$$



$$\cos B = \frac{120^2 + 86^2 - 120^2}{-2(86)(120)} = \frac{-7346}{-20640} = .3558$$

$$m\angle B = 69.00$$

$$m\angle B = 69^\circ$$

$$m\angle C = 69^\circ$$

15.  $a = 12.5, b = 15.1, c = 10.3$

$$\cos A = \frac{12.5^2 + 15.1^2 - 10.3^2}{-2(15.1)(10.3)} = .57175$$

$$m\angle A = 55.1^\circ$$

$$\cos B = \frac{15.1^2 + 12.5^2 - 10.3^2}{-2(12.5)(10.3)} = .133$$

$$m\angle B = 82.3^\circ$$

$$180 - A - B = m\angle C = 42.6^\circ$$