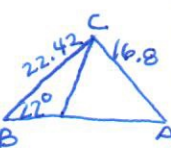


11.5 Law of Sines

Practice

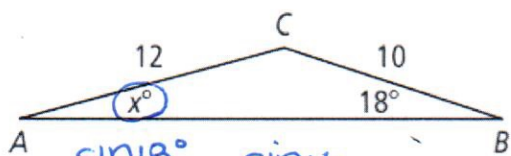
Indicate whether the given measurements result in no triangles, one triangle, or two triangles. Solve the resulting triangle. Round your answer to the nearest hundredth.



<p>1) $B = 22^\circ, b = 16.8, a = 22.42$ <i>Acute</i> $16.8 < 22.42$ 2 Triangles</p> <p>① $\frac{\sin 22^\circ}{16.8} = \frac{\sin A}{22.42}$ $A = \sin^{-1}\left(\frac{22.42 \sin 22^\circ}{16.8}\right)$ $A = 29.99^\circ$</p> <p>$C = 180^\circ - 22^\circ - 29.99^\circ = 128.01^\circ$ $\frac{\sin 22^\circ}{16.8} = \frac{\sin 128.01^\circ}{c}$ $c = 35.34$</p> <p>② $A = 180 - 29.99^\circ = 150.01^\circ$ $C = 180 - 22 - 150.01 = 7.99^\circ$ $c = 6.23$</p>	<p>2) $B = 96^\circ, b = 3, a = 24$</p>
<p>3) $B = 49^\circ, b = 9, a = 7$ <i>Acute</i> $9 > 7$ 1 Δ</p> <p>$\frac{\sin 49^\circ}{9} = \frac{\sin A}{7}$ $7 \sin 49^\circ = 9 \sin A$ $A = \sin^{-1}\left(\frac{7 \sin 49^\circ}{9}\right)$ $A = 35.94^\circ$</p> <p>$C = 180 - 49 - 35.94^\circ = 95.06^\circ$ $c = 11.88$</p>	<p>4) $B = 64^\circ, A = 64^\circ, a = 8$</p>

Use the Law of Sines. Find the measure of x to the nearest tenth.

5)



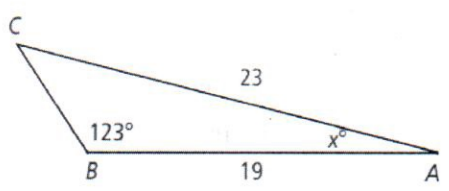
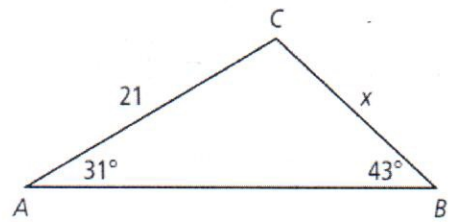
$$\frac{\sin 18^\circ}{12} = \frac{\sin x}{10}$$

$$10 \sin 18^\circ = 12 \sin x$$

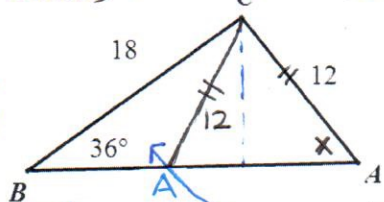
$$\sin x = \frac{10 \sin 18^\circ}{12}$$

7) $\sin^{-1}(\sin x) = \sin^{-1}(0.258)$
 $x = 14.9^\circ$

6)



Acute
 $12 < 18$
 $12 > h$
*** 2 Δ 's!!**



$$\frac{\sin 36^\circ}{12} = \frac{\sin A}{18}$$

$$18 \sin 36^\circ = 12 \sin A$$

$$\sin A = \frac{18 \sin 36^\circ}{12} = 0.8817$$

$$A = \sin^{-1}(0.8817) = 61.85^\circ$$

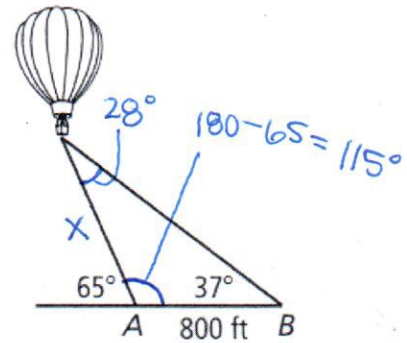
$180 - 61.85^\circ$
 $x = 118.15^\circ$

- 9) A hot-air balloon is observed from two points, A and B, on the ground 800 ft apart as shown in the diagram. The angle of elevation of the balloon is 65° from point A and 37° from point B. Find the distance from point A to the balloon.

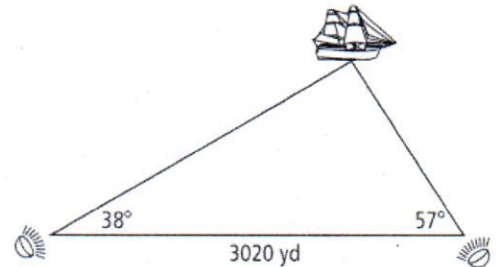
$$\frac{\sin 28^\circ}{800} = \frac{\sin 37^\circ}{x}$$

$$x \sin 28^\circ = 800 \sin 37^\circ$$

$$x = \frac{800 \sin 37^\circ}{\sin 28^\circ} = \boxed{1025.52 \text{ ft}}$$



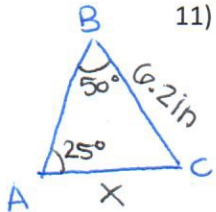
- 10) Two searchlights on the shore of a lake are located 3020 yd apart as shown in the diagram. A ship in distress is spotted from each searchlight. The beam from the first searchlight makes an angle of 38° with the baseline. The beam from the second light makes an angle of 57° with the baseline. Find the ship's distance from each searchlight.



In $\triangle ABC$, $m\angle A = 25^\circ$ and $m\angle B = 50^\circ$. Find each value to the nearest tenth.

- 11) Find AC for $BC = 6.2$ in.

- 12) Find BC for $AC = 14.9$ cm.



$$\frac{\sin 25^\circ}{6.2} = \frac{\sin 50^\circ}{x}$$

$$x \sin 25^\circ = 6.2 \sin 50^\circ$$

$$x = \frac{6.2 \sin 50^\circ}{\sin 25^\circ}$$

$$x = \boxed{11.2 \text{ in}}$$

Verify the following identities.

13) $\cot x + 1 = \csc x (\cos x + \sin x)$

$$\csc x \cos x + \csc x \sin x$$

$$\frac{1}{\sin x} \cdot \cos x + \frac{1}{\sin x} \cdot \sin x$$

$$\frac{\cos x}{\sin x} + 1$$

$$\cot x + 1 \quad \square$$

14) $\frac{\sin x}{\cos x + 1} + \frac{\cos x - 1}{\sin x} = 0$