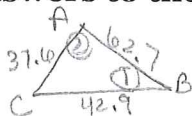


Solve. If necessary, round answers to the nearest hundredth.

1. $a=42.9$ $b=37.6$ $c=62.7$



$$37.6^2 = 62.7^2 - 42.9^2 - 2(62.7)(42.9)\cos B$$

$$1413.76 = 5771.7 - 5379.66\cos B$$

$$-4357.94 = -5379.66\cos B$$

$$.81007 = \cos B$$

$$\boxed{35.9^\circ = \angle B}$$

$$\frac{37.6}{\sin 35.9} = \frac{42.9}{\sin A}$$

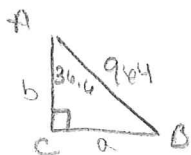
$$\sin A = .6690\dots$$

$$A = 41.991$$

$$\boxed{\angle A = 41.99^\circ}$$

$$\boxed{\angle C = 102.1^\circ}$$

3. $A=36.6^\circ$ $C=90^\circ$ $c=964$



$$\boxed{\angle B = 53.4^\circ}$$

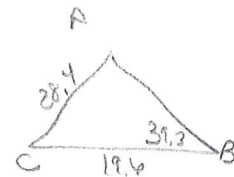
$$\sin 36.6^\circ = \frac{a}{964}$$

$$\boxed{a = 574.76}$$

$$\cos 36.6^\circ = \frac{b}{964}$$

$$\boxed{b = 773.92}$$

SSA!
2. $B=39.3^\circ$ $a=19.6$ $b=28.4$



$$\frac{28.4}{\sin 39.3} = \frac{19.6}{\sin A}$$

$$\sin A = .43712\dots$$

$$\boxed{\angle A = 25.92^\circ}$$

$$\rightarrow \angle A_2 = 154.1^\circ$$

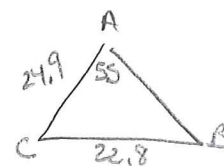
$$\boxed{\angle C = 114.78^\circ}$$

$$\angle C_2 = -13.4^\circ$$

$$\frac{28.4}{\sin 39.3} = \frac{c}{\sin 114.8}$$

$$\boxed{c = 40.70}$$

4. $A=55^\circ$ $a=22.8$ $b=24.9$



$$\frac{22.8}{\sin 55} = \frac{24.9}{\sin B}$$

$$\sin B = .8944\dots$$

$$\boxed{\angle B = 63.46^\circ}$$

$$\rightarrow \angle B_2 = 116.54^\circ$$

$$\boxed{\angle C = 61.54^\circ}$$

$$\boxed{\angle C_2 = 8.46^\circ}$$

$$\frac{22.8}{\sin 55} = \frac{c}{\sin 61.54}$$

$$\boxed{c = 24.47}$$

$$\frac{22.8}{\sin 55} = \frac{c_2}{\sin 8.46}$$

$$\boxed{c_2 = 4.09}$$

5. $B = 74.8^\circ$ $a = 8.9$ $c = 6.4$



$$b^2 = 8.9^2 + 6.4^2 - 2(8.9)(6.4)\cos 74.8$$

$$b^2 = 90.301$$

$$b = 9.50$$

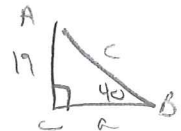
$$\frac{9.5}{\sin 74.8} = \frac{6.4}{\sin C}$$

$$\sin C = .650 \dots$$

$$\angle C = 40.55^\circ$$

$$\angle A = 64.65^\circ$$

6. $B = 40^\circ$ $C = 90^\circ$ $b = 19$



$$\angle A = 50^\circ$$

$$\sin 40 = \frac{19}{c}$$

$$c = \frac{19}{\sin 40}$$

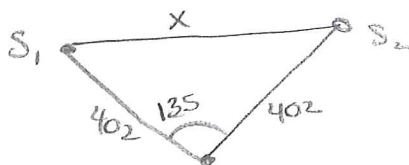
$$c = 29.56$$

$$\tan 40 = \frac{19}{a}$$

$$a = \frac{19}{\tan 40}$$

$$a = 22.64$$

7. Two ships leave a harbor together, traveling on courses that have an angle of 135° between them. If they each travel 402 miles, how far apart are they?



$$x^2 = 402^2 + 402^2 - 2(402)(402)\cos 135$$

$$x^2 = 551750.5685$$

$$x = 742.799$$

$$742.80 \text{ miles}$$

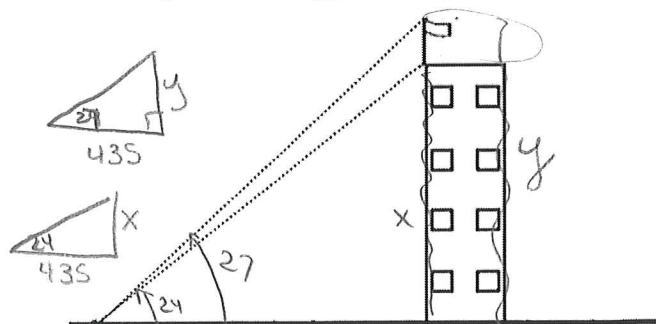
8. From a point 435 feet from the base of a building, it is observed that the angle of elevation to the top of the building is 24° and the angle of elevation to the top of the flagpole atop the building is 27° . Find the height of the flagpole.

$$\tan 27 = \frac{y}{435}$$

$$y = 221.64$$

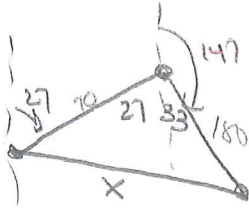
$$\tan 24 = \frac{x}{435}$$

$$x = 193.67$$



$$\text{flagpole: } 27.97 \text{ feet}$$

9. A ship travels 70 km on a bearing of 27° . It then turns and travels on a bearing of 147° for 180 km. Find the distance between the end point and starting point.

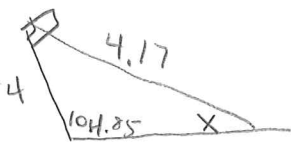


$$70^2 + 180^2 = x^2$$

$$37300 = x^2$$

$$x = 193.13 \text{ km}$$

10. A 4 m flag pole is not standing up straight. There is a wire attached to the top of the pole and anchored in the ground. The wire is 4.17 m long. ~~The wire makes a 68° angle with the ground.~~ What angle does the ~~flag pole make with the wire?~~



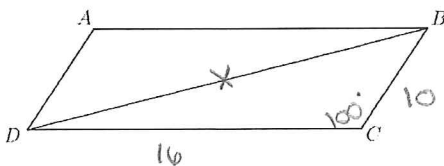
$$\frac{4.17}{\sin 104.85} = \frac{4}{\sin x}$$

$$\sin x = .92719 \dots$$

$$x = 68.00$$

$$68^\circ$$

11. In parallelogram ABCD, side DC is 16 inches, side BC is 10 inches and angle BCD is 100° . Find the length of the diagonal BD.

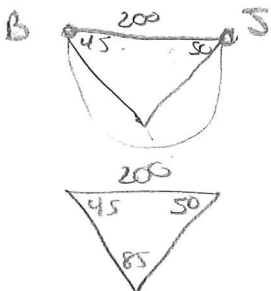


$$x^2 = 10^2 + 16^2 - 2(10)(16)\cos 100$$

$$x^2 = 411.56 \dots$$

$$x = 20.29 \text{ in}$$

12. Bianca and Jonathan are on opposite sides of a 200 foot wide canyon. They lay flat on their tummies to use their binoculars to find the trail guide. Jonathan spots the trail guide at an angle of depression of 50° while Bianca can see the trail guide at an angle of depression of 45° . How far is Bianca from the trail guide?



$$\frac{200}{\sin 85} = \frac{x}{\sin 50}$$

$$x = 153.79 \text{ feet}$$