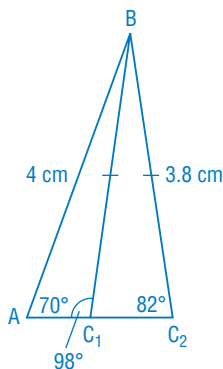


Lesson 6.3 Math Lab: Assess Your Understanding, pages 468–469

1. In $\triangle ABC$, $AB = 4$ cm and $\angle A = 70^\circ$

a) Sketch a diagram to show that there are two triangles with $BC = 3.8$ cm.



b) To the nearest degree, measure $\angle C$ for each triangle.

$$\angle C = 98^\circ \text{ or } 82^\circ$$

c) To the nearest hundredth of a centimetre, calculate the length of BC for which $\triangle ABC$ is a right triangle.

If $\triangle ABC$ is a right triangle, then

$$\sin A = \frac{BC}{AB}$$

$$\sin 70^\circ = \frac{BC}{4}$$

$$BC = 4 \sin 70^\circ$$

$$BC = 3.7587 \dots$$

To the nearest hundredth of a centimetre, $BC = 3.76$ cm

2. In $\triangle ABC$, $AB = 4$ cm, $BC = 3.5$ cm, and $\angle A = 70^\circ$

Use the completed chart in Part D to justify that it is not possible to draw a triangle.

$$\frac{BC}{AB} = \frac{3.5}{4}, \text{ or } 0.875$$

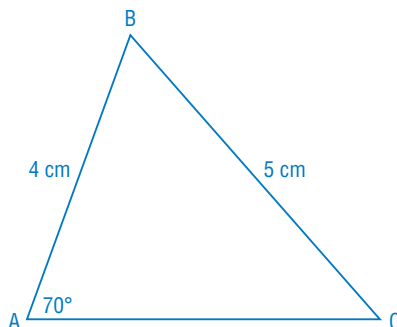
$$\sin 70^\circ \doteq 0.940$$

Since $\frac{BC}{AB} < \sin 70^\circ$, then no triangle is possible

3. In $\triangle ABC$, $AB = 4$ cm and $\angle A = 70^\circ$

- a) Choose a value for BC for which a unique triangle that is not a right triangle can be drawn. Draw the triangle.

Sample response:



- b) Use the completed chart in Part D to justify that only one scalene triangle can be drawn with the value you chose for BC .

Sample response: I chose $BC = 5$ cm.

$$\frac{BC}{AB} = \frac{5}{4} = 1.25$$

Since $\frac{BC}{AB} > 1$, then only one triangle is possible

4. In $\triangle ABC$, $AB = 10$ cm and $BC = 8$ cm; to the nearest degree, determine possible measures of acute $\angle A$ for each situation.

- a) No triangle is possible.

$\angle A$ is acute, so $\angle A < 90^\circ$

For no triangle, $\sin A > \frac{8}{10}$, or 0.8

$$\sin^{-1}(0.8) \doteq 53^\circ$$

For an acute angle θ , as θ increases, $\sin \theta$ also increases.

So, for no triangle, $53^\circ < \angle A < 90^\circ$

- b) One right triangle is possible.

For a right triangle, $\frac{BC}{AB} = \sin A$

So, $\sin A = 0.8$

From part a, $\angle A \doteq 53^\circ$; so, for one right triangle, $\angle A \doteq 53^\circ$

- c) Two scalene triangles are possible.

For two scalene triangles, $\sin A < \frac{BC}{AB} < 1$

$$\frac{BC}{AB} = 0.8, \text{ so } \sin A < 0.8$$

From part a, $\angle A < 53^\circ$; so, for two scalene triangles, $\angle A < 53^\circ$