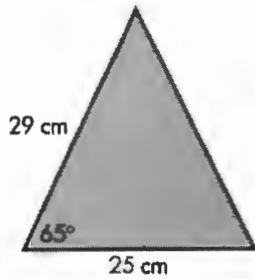


8.9 – The Law of Sine

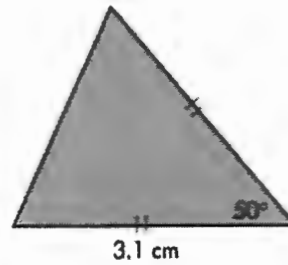
Find the height of each triangle to the nearest tenth.

1)



$$h \approx 26.3 \text{ cm}$$

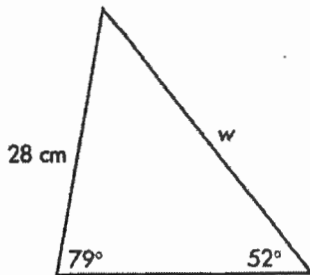
2)



$$h \approx 2.4 \text{ cm}$$

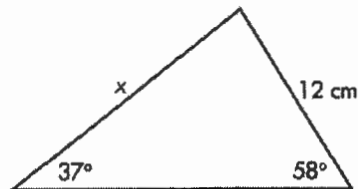
Find the length of each indicated side to the nearest tenth.

3)



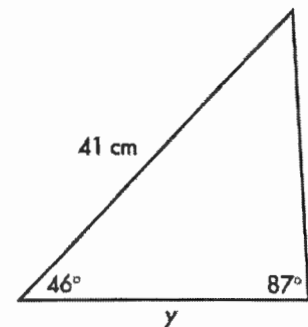
$$w \approx 34.9 \text{ cm}$$

4)



$$x \approx 16.9 \text{ cm}$$

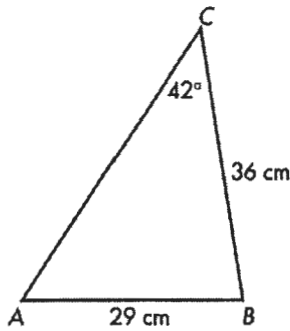
5)



$$y \approx 29.5 \text{ cm}$$

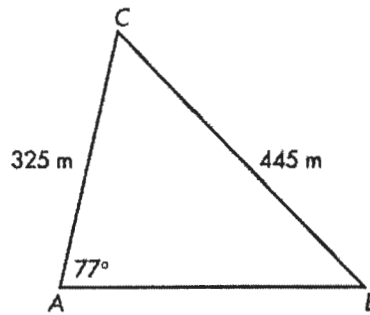
Find the measure of each indicated angle in each acute triangle to the nearest degree.

6) $m\angle A \approx$



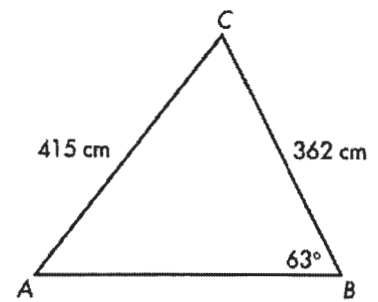
$\approx 56^\circ$

7) $m\angle B \approx$



$\approx 45^\circ$

8) $m\angle C \approx$



$\approx 66^\circ$

- 9) Igor's pet bat, Natasha, is flying at the end of a 50-foot leash. Using an angle measuring device, Igor spots Natasha at a 55° angle up from the horizontal. To the nearest foot, how high is Natasha flying if the leash is taut and anchored to the ground?

41 ft.

- 10) Archaeologist Ertha Diggs is using an angle-measuring device to determine the height of an ancient temple. When she views the top of the temple through her device, she records a 37° angle up from the horizontal. She is standing 130 meters from the center of the temple's base, and her eye is 1.5 meters above the ground. To the nearest tenth of a meter, how tall is the temple?

99.5 m

11)



According to legend, Galileo used the leaning tower of Pisa to conduct his experiments on the laws of gravity. When he dropped objects from the top of the 55-meter tower (measured length, not height, of tower), they landed 4.8 meters from the tower's base. To the nearest degree, what is the angle ϕ that the tower leans off from the vertical?

5°

12)

One of the most impressive of the Mayan pyramids is El Castillo pyramid in Chichen Itza, Mexico. The pyramid has a platform on its top and a flight of 91 steps on each of its four sides. (Four flights of 91 steps equal 364 steps in all. The top platform adds a level, so the



pyramid consists of 365 levels, which represent the 365 days of the Mayan

year.) To the nearest centimeter, what is the height of the top of the steps if each of the 91 steps is 30 cm deep by 26 cm high? To the nearest degree, what is the angle of ascent (elevation)?

2366 cm

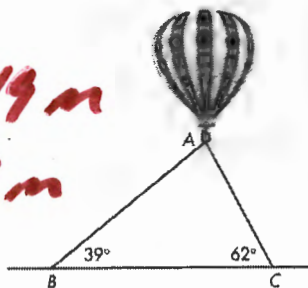
41°

- 13) Alphonse is directly over the 2500-meter landing strip in his hot-air balloon (point A) and is observed at one end of the strip by Beatrice (point B) with an angle of elevation measuring 39° . Meanwhile, at the other end of the strip, Collette (point C) observes the balloon with an angle of elevation of 62° . What is the distance between Alphonse and Beatrice? What is the distance between Alphonse and Collette? How high up is Alphonse when he is observed?

$AB \approx 2249 \text{ m}$

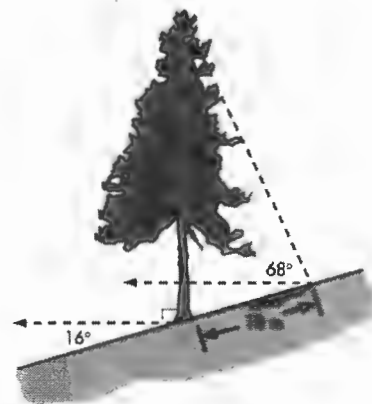
$AC \approx 1603 \text{ m}$

1415 m
high



14)

A tree is growing vertically on a hillside that is at a 16° angle to the horizontal. The tree casts a shadow 18 m long up from the slope. If the angle of elevation of the sun measures 68° , how tall is the tree?



47.8 m