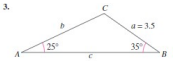
GO COUGARS!

p 436

Homework Questions

In Exercises 1–18, use the Law of Sines to solve the triangle. Round your answers to two decimal places.

3.



5. $A = 36°, \quad a = 8, \quad b = 5$

6. $A = 60°, \quad a = 9, \quad c = 10$

9. $A = 83°\,20', \quad C = 54.6°, \quad c = 18.1$

17. $A = 55°, \quad B = 42°, \quad c = \frac{1}{4}$

In Exercises 19–24, use the Law of Sines to solve (if possible) the triangle. If two solutions exist, find both. Round your answers to two decimal places.

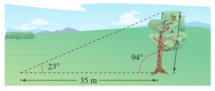
X **19.** $A = 76°, \quad a = 18, \quad b = 20$

In Exercises 29–34, find the area of the triangle having the indicated angle and sides.

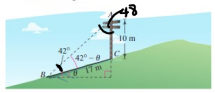
29. $C = 120°, \quad a = 4, \quad b = 6$

33. $B = 72°\,30', \quad a = 105, \quad c = 64$

35. ***Height*** Because of prevailing winds, a tree grew so that it was leaning 4° from the vertical. At a point 35 meters from the tree, the angle of elevation to the top of the tree is 23° (see figure). Find the height h of the tree.



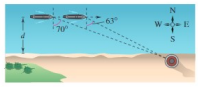
37. ***Angle of Elevation*** A 10-meter telephone pole casts a 17-meter shadow directly down a slope when the angle of elevation of the sun is 42° (see figure). Find θ, the angle of elevation of the ground.



$\frac{\sin 48}{17} = \frac{\sin B}{10}$

$\frac{10 \sin 48}{17} = \sin B$

43. ***Distance*** A boat is sailing due east parallel to the shoreline at a speed of 10 miles per hour. At a given time, the bearing to the lighthouse is S 70° E, and 15 minutes later the bearing is S 63° E (see figure). The lighthouse is located at the shoreline. What is the distance from the boat to the shoreline?



Feb 2-9:51 PM

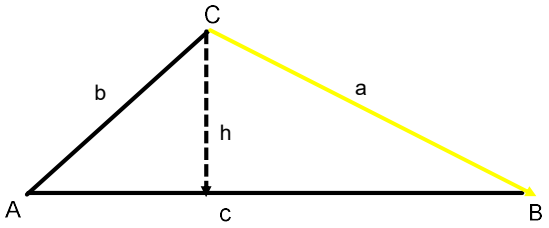
6.1 Area and the Law of Sines
day 2

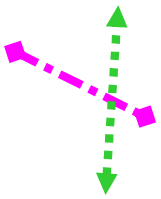
Page 9

Ambiguous Case

What does ambiguous mean?

The ambiguous case for Law of Sines occurs when you are given an acute angle and two sides.



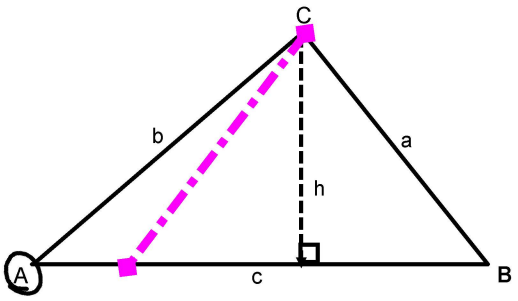


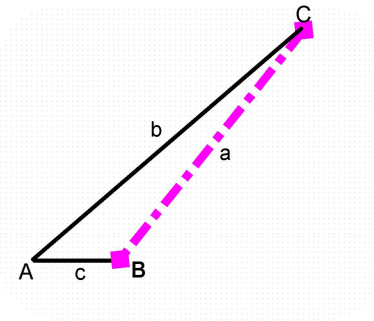
The angle given is acute. We will call it A.

a < h no triangle

a = h one triangle - right

a ≥ b one triangle





h < a < b two triangles

What changes? < B < C side c

If you are given 2 angles can there be two triangles?

Apr 3-11:10 AM

If you are given only one acute angle.....always test to determine the number of triangles.

height < opp side < adj side

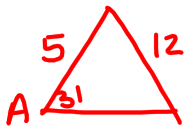
Find h if h < a < b then two triangles!!!!

(big, bigger, biggest)

Remember: the variables may be different, so if the height is smaller than the opposite side and the opposite side is smaller than the adjacent side, then you have an ambiguous triangle.

Apr 3-11:16 AM

A = 31°, a = 12, b = 5



$\frac{\sin 31}{12} = \frac{\sin B}{5}$

$\frac{5\sin 31}{12} = \sin B$

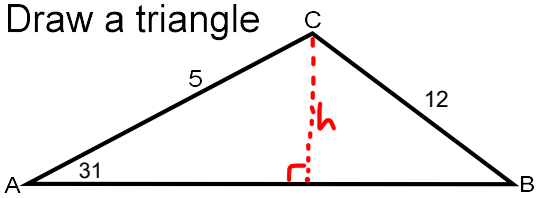
$B = 12.39$

$\frac{\sin 31}{12} = \frac{\sin 136.61}{C}$

$12\sin 136.61 = C\sin 31$

$C = \frac{12\sin 136.61}{\sin 31}$

Draw a triangle



h

find h - 0, 1, or 2 triangles?

$\sin 31 = \frac{h}{5}$

$5\sin 31 = h$

$2.58 = h$

1 △

A = 31 a = 12

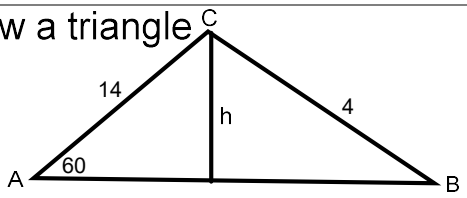
B = 12.39 b = 5

C = 136.61 c = 16.01

Apr 3-4:50 PM

A = 60°, a = 4, b = 14

Draw a triangle



Only one angle is given so find h.
0, 1, or 2 triangles?

$\sin 60 = \frac{h}{14}$

$14\sin 60 = h$

$h = 12.12$

no △

A = 60 a = 4

B = b = 14

C = c =

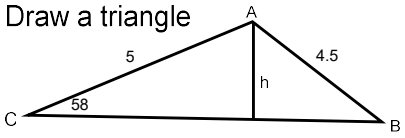
Apr 3-4:42 PM

C = 58°, b = 5, c = 4.5

$\frac{\sin 58}{4.5} = \frac{\sin B}{5}$

$\sin^{-1}\left(\frac{5\sin 58}{4.5}\right) = B$

Draw a triangle



find h - 0, 1, or 2 triangles?

$\sin 58 = \frac{h}{5}$

$5\sin 58 = h$

$h = 4.24$

$4.2 < 4.5 < 5$

2 Δ's

A = 51.56 a = 4.16

B = 70.44 b = 5

C = 58 c = 4.5

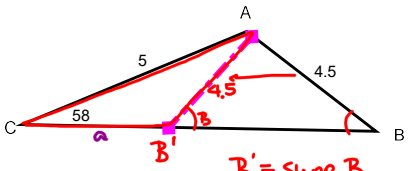
$B' = 180 - 70.44$

$= 109.56$

$A' = 180 - 109.56 - 58$

$\frac{\sin 58}{4.5} = \frac{\sin 12.44}{a}$

$\frac{4.5\sin 12.44}{\sin 58} = a$



$B' = \text{supp } B$

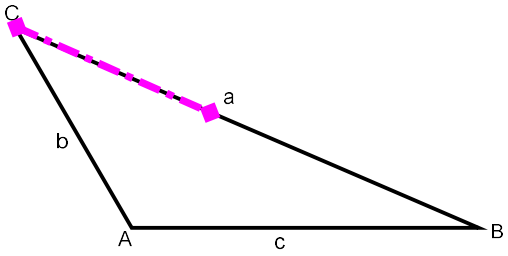
A' = 12.44 a = 1.1

B' = 109.56 b = 5

C = 58 c = 4.5

Apr 3-4:56 PM

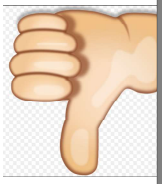
What if the given angle is obtuse?



If a > b 1 triangle

If a < b 0 triangle

If the given angle is obtuse can the triangle be ambiguous?
So proceed to solve as usual!



Apr 3-5:16 PM

Homework

p 436

6, 11, 15, 23, 25, 27,
31, 39, 40, 41, 43