

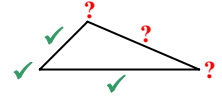
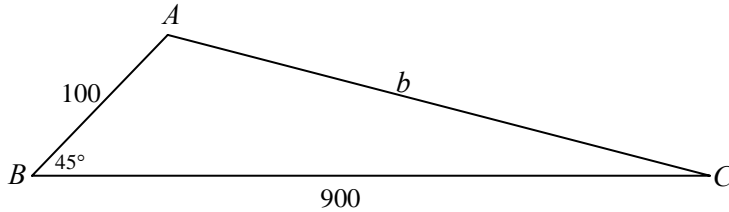
EXAMPLES INVOLVING LAW OF SINES AND LAW OF COSINES

Instructions

First review the law of sines and the law of cosines. Then try to solve each of the following problems without consulting the solutions found in the notes for this unit. Only once you have made a valiant attempt to solve all the problems should you consult the solutions.

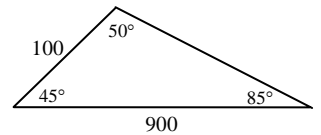
Examples

1. Solve the following triangle.



2. Answer the following questions.

- (a) Explain the meaning of the word “ambiguous.”
- (b) Explain why the law of sines *has* an ambiguous case.
- (c) Explain why the law of cosines *does not have* an ambiguous case.
- (d) Refer to example 0. Explain why it is not possible for $\angle A$ to have a measure of 50° . That is, explain why it is not possible to construct the triangle shown at the right.
- (e) Suppose that a solution of the equation $\sin \theta = k$ is the first quadrant angle α . What would be a second quadrant solution?
- (f) In $\triangle ABC$, $\angle A = 37^\circ$, $a = 3$ cm and $c = 4$ cm. How many different triangles are possible?



3. The light from a rotating offshore beacon can illuminate effectively up to a distance of 250 m. A point on the shore is 500 m from the beacon. From this point, the sight line to the beacon makes an angle of 20° with the shoreline.

- (a) What length of shoreline is illuminated effectively by the beacon?
- (b) What area of the shore is illuminated effectively by the beacon?

