

Pre-Calculus 11 - VLN

Chapter 6: Trigonometry

Lesson 3: Sine Law - The Ambiguous Case

Question #1

Reference Q.17964

How many different triangles can a Side-Side-Angle (SSA) triangle have?

- A. Exactly 1 unique triangle.
- B. Exactly 2 different triangles.
- C. At least 2 different triangles.
- D. At most 2 different triangles.

Question #2

Reference Q.17969

Consider the triangle $\triangle ABC$ with $\angle A = 58^\circ$, $a = 50$, $b = 30$.

- a. How many triangles are possible?
- b. If this triangle is solvable, solve the triangle. If this triangle is not solvable, change the a value so that the triangle is solvable.

Question #3

Reference Q.17970

Consider the triangle $\triangle ABC$ with $\angle A = 89^\circ$, $a = 80$, $b = 80$.

- a. How many triangles are possible?
- b. If the triangle is solvable, solve the triangle. If this triangle is not solvable, change the a value so that the triangle is solvable.

Question #4

Reference Q.17971

Consider the triangle $\triangle ABC$ with $\angle A = 45^\circ$, $a = 1$, $b = 2$.

- a. How many triangles are possible?
- b. If this triangle is solvable, solve the triangle. If this triangle is not solvable, change the a value so that the triangle is solvable. (Note: You don't have to solve the entire triangle just give a valid reason why your triangle is solvable.)

Question #5

Reference Q.13338

Without using the sine law, determine in which of the following there is exactly one solution to the problem, i.e. there is only one triangle which can be constructed from the given information.

- a. Calculate $\angle C$ in $\triangle ABC$ where $\angle B = 29^\circ$, $c = 8.2\text{cm}$, and $b = 6.7\text{cm}$
- b. Calculate $\angle TSV$ in $\triangle STV$ where $ST = 18\text{in}$, $TV = 14\text{in}$, and $\angle SVT = 36^\circ$
- c. Calculate $\angle ABC$ in $\triangle ABC$ where $\angle ACB = 51^\circ$, $AB = 3.9\text{mm}$, and $AC = 4.9\text{mm}$

Question #6

Reference Q.13339

Find all possible measures of $\angle C$ in the following triangles.

- a. $\triangle ABC$ where $\angle A = 31^\circ$, $a = 4.5\text{cm}$ and $c = 4.9\text{cm}$
- b. $\triangle ABC$ where $\angle A = 61^\circ$, $a = 7.5\text{cm}$ and $c = 5.8\text{cm}$

Question #7

Reference Q.13342

In triangle PQR, $\angle P = 30^\circ$, $QR = 5\text{cm}$, and $PR = 7.5\text{cm}$. The measure of $\angle PQR$ is

- A. 19.4°
- B. $19.4^\circ, 161.6^\circ$
- C. 48.6°
- D. $48.6^\circ, 131.4^\circ$

Question #8

Reference Q.13340

If $\triangle LMN$, and $\angle M = 42^\circ$, $LN = 32\text{mm}$ and $LM = 42\text{mm}$. Calculate all possible measures of $\angle MLN$ to the nearest degree.

Question #9

Reference Q.13341

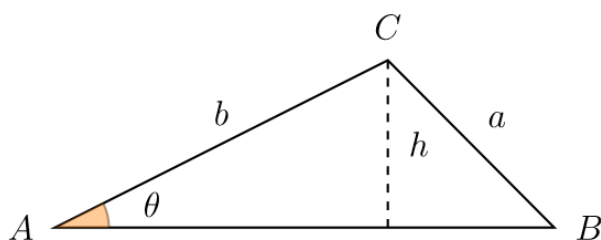
In each case, determine all possible measures of the indicated angle.

- $\triangle DNA$ where $\angle N = 35^\circ$, $d = 4.1\text{cm}$ and $n = 2.1\text{cm}$. Determine $\angle D$.
- $\triangle EFG$ where $\angle GEF = 53^\circ$, $EF = 7.2\text{cm}$ and $GF = 6.5\text{cm}$. Determine $\angle GFE$.

Question #10

Reference Q.17965

Consider the SSA triangle given below:



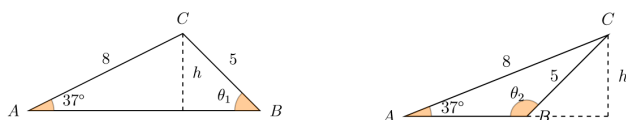
Decide if the following statements are true (T) or false (F). Circle the correct one.

- If $\angle A = \theta$ and the sides a, b are known, this triangle is a right triangle if and only if $h < a$. (T/F)
- Suppose $\angle A = \theta$ and the sides a, b are known. This triangle is solvable if $b \sin \theta < a$. (T/F)

Question #11

Reference Q.17966

Suppose $\angle A = 37^\circ$, $a = 5$, $b = 8$. Then, we may draw the following triangles:

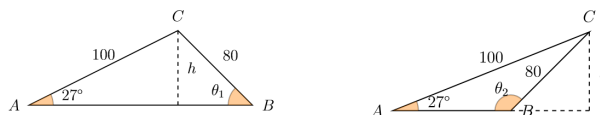


- Although the two triangles are given above, we are not quite sure how many triangles are possible. Decide how many triangles are possible and justify your answer.
- If this triangle is solvable, find θ_1 .
- Find θ_2 using the answer θ_1 in part (b).

Question #12

Reference Q.17967

Suppose $\angle A = 27^\circ$, $a = 80$, $b = 100$. Then, we may draw the following triangles:

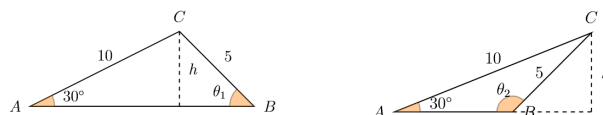


- Although the two triangles are given above, we are not quite sure how many triangles are possible. Decide how many triangles are possible and justify your answer.
- If this triangle is solvable, find θ_1 .
- Find θ_2 using the answer θ_1 in part (b).

Question #13

Reference Q.17968

Suppose $\angle A = 30^\circ$, $a = 5$, $b = 10$. Then, we may draw the following triangles:



- Although the two triangles are given above, we are not quite sure how many triangles are possible. Decide how many triangles are possible and justify your answer.
- If this triangle is solvable, find θ_1 .
- Find θ_2 using the answer θ_1 in part (b).

Question #14

Reference Q.13337

Explain what is meant by the ambiguous case of the sine law. Describe situations in which a sine law problem may have no solution, one solution, or two solutions.