

A2.A.75: Law of Sines - The Ambiguous Case 3: Determine the solution(s) from the SSA situation (ambiguous case)

- 1 In $\triangle ABC$, if $AC = 12$, $BC = 11$, and $m\angle A = 30$, angle C could be
 - 1) an obtuse angle, only
 - 2) an acute angle, only
 - 3) a right angle, only
 - 4) either an obtuse angle or an acute angle

- 2 In $\triangle ABC$, $m\angle A = 30$, $a = 14$, and $b = 20$. Which type of angle is $\angle B$?
 - 1) It must be an acute angle.
 - 2) It must be a right angle.
 - 3) It must be an obtuse angle.
 - 4) It may be either an acute angle or an obtuse angle.

- 3 If side $a = 16$, side $b = 20$, and $m\angle A = 30$, how many distinct triangles can be constructed?
 - 1) one acute triangle, only
 - 2) two triangles
 - 3) one obtuse triangle, only
 - 4) no triangles

- 4 Which statement best describes a triangle that can be constructed if $m\angle A = 30$, $a = \frac{1}{4}$, and $b = \frac{1}{2}$?
 - 1) It is a right triangle.
 - 2) It is an obtuse triangle.
 - 3) It is not unique.
 - 4) It cannot be constructed.

- 5 In $\triangle KLM$, $KL = 20$, $LM = 13$, and $m\angle K = 40$. The measure of $\angle M$?
 - 1) must be between 0° and 90°
 - 2) must equal 90°
 - 3) must be between 90° and 180°
 - 4) is ambiguous

- 6 If $m\angle A = 30$, side $a = 6$, and side $b = 10$, what is the total number of noncongruent triangles that can be constructed?

- 7 A landscape designer is designing a triangular garden with two sides that are 4 feet and 6 feet, respectively. The angle opposite the 4-foot side is 30° . How many distinct triangular gardens can the designer make using these measurements?

- 8 Determine the maximum number of triangles possible when $m\angle A = 150$, $a = 14$, and $b = 10$.
- 9 If $m\angle A = 35$, $b = 3$, and $a = 4$, how many different triangles can be constructed?
- | | |
|-------------------------------------|------------------------------|
| 1) No triangles can be constructed. | 3) one right triangle, only |
| 2) two triangles | 4) one obtuse triangle, only |
- 10 If $m\angle A = 32$, $a = 5$ and $b = 3$, it is possible to construct
- | | |
|---------------------------|---------------------|
| 1) an obtuse triangle | 3) no triangles |
| 2) two distinct triangles | 4) a right triangle |
- 11 If $a = 5$, $c = 4$, and $m\angle A = 40$, then which type of triangle, if any, can be constructed?
- | | |
|----------------------------|-----------------------------|
| 1) a right triangle, only | 3) an obtuse triangle, only |
| 2) an acute triangle, only | 4) no triangle |
- 12 Given $\triangle ABC$ with $a = 9$, $b = 10$, and $m\angle B = 70$, what type of triangle can be drawn?
- | | |
|-----------------------------|---|
| 1) an acute triangle, only | 3) both an acute triangle and an obtuse triangle |
| 2) an obtuse triangle, only | 4) neither an acute triangle nor an obtuse triangle |
- 13 Main Street and Central Avenue intersect, making an angle measuring 34° . Angela lives at the intersection of the two roads, and Caitlin lives on Central Avenue 10 miles from the intersection. If Leticia lives 7 miles from Caitlin, which conclusion is valid?
- | |
|---|
| 1) Leticia cannot live on Main Street. |
| 2) Leticia can live at only one location on Main Street. |
| 3) Leticia can live at one of two locations on Main Street. |
| 4) Leticia can live at one of three locations on Main Street. |
- 14 In triangle ABC , determine the number of distinct triangles that can be formed if $m\angle A = 85$, side $a = 8$, and side $c = 2$. Justify your answer.
- 15 In $\triangle MNP$, $m = 6$ and $n = 10$. Two distinct triangles can be constructed if the measure of angle M is
- | | |
|-------|-------|
| 1) 35 | 3) 45 |
| 2) 40 | 4) 50 |

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Answer Section

1 ANS: 4 REF: 010309b

2 ANS: 4 REF: 010720b

3 ANS: 2 REF: 080323siii

4 ANS: 1 REF: 080231siii

5 ANS: 4

$$\frac{13}{\sin 40} = \frac{20}{\sin M} \cdot 81 + 40 < 180. (180 - 81) + 40 < 180$$

$$M \approx 81$$

REF: 061327a2

6 ANS:

2

REF: 018513siii

7 ANS:

2

REF: 010426b

8 ANS:

1

REF: 060015siii

9 ANS: 4 REF: 011018b

10 ANS: 1 REF: 080031siii

11 ANS: 3 REF: 010135siii

12 ANS: 1

$$\frac{9}{\sin A} = \frac{10}{\sin 70} \cdot 58^\circ + 70^\circ \text{ is possible. } 122^\circ + 70^\circ \text{ is not possible.}$$

$$A \approx 58$$

REF: 011210a2

13 ANS: 3 REF: 060119b

14 ANS:

$$\frac{8}{\sin 85} = \frac{2}{\sin C} \quad 85 + 14.4 < 180 \quad 1 \text{ triangle}$$

$$C = \sin^{-1} \left(\frac{2 \sin 85}{8} \right) \quad 85 + 165.5 \geq 180$$

$$C \approx 14.4$$

REF: 061529a2

15 ANS: 1

$$\frac{6}{\sin 35} = \frac{10}{\sin N}$$

$$N \approx 73$$

$$73 + 35 < 180$$

$$(180 - 73) + 35 < 180$$

REF: 061226a2