Student: Cole Lamers **Date:** 07/21/19	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** 7.1 The Law of Sines

1. Complete the following statement.

   If you know two angles of a triangle, you can determine the third angle because the sum of all three angles is _____ degrees.

   If you know two angles of a triangle, you can determine the third angle because the sum of all three angles is 180 degrees.
   (Type a whole number.)

2. Complete the sentence below.

   For a triangle with sides a, b, c, and opposite angles A, B, C, the law of sines states that _____.

   For a triangle with sides a, b, c, and opposite angles A, B, C, the law of sines states that $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$.

3. Given two sides of a triangle and an angle opposite one side, can the Law of Sines be used to solve for the remaining measurements?

   Choose the correct answer below.

   - **A.** Yes. It will be a right triangle.
   - **B.** Yes. There may be several possible solutions.
   - **C.** No. There is not enough information to use the Law of Sines in this case.

4. Determine the number of triangles that can be drawn with the given data.

   $a = 43, b = 72, A = 36^\circ$

   Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

   - **A.** No triangle can be drawn with the given measurements.
   - **B.** The number of triangles that can be drawn with given measurements are 2.
     (Type a whole number.)

5. Determine the number of triangles that can be drawn with the given data

   $A = 37.4^\circ, a = 3.6, c = 18.9$

   Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

   - **A.** The number of triangles that can be drawn with given measurements are .
     (Type a whole number.)
   - **B.** No triangle can be drawn with the given measurements.

6. Determine the number of triangles that can be drawn with the given data

   $b = 16, c = 7, B = 155^\circ$

   Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

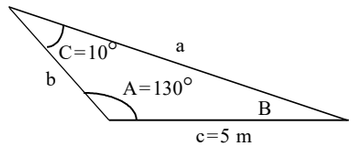
   - **A.** The number of triangles that can be drawn with given measurements are 1.
     (Type a whole number.)
   - **B.** No triangle can be drawn with the given measurements.

7. Given $B = 30^\circ$, $C = 105^\circ$, and $a = 6$, find the exact value of b in triangle ABC.

   $b =$ $3\sqrt{2}$ (Type an exact answer, using radicals as needed.)

8. This question has been removed from this assignment by your instructor; you have received full credit.

9. Solve the triangle shown to the right.

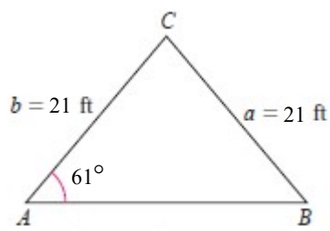


B = 40 ° (Type an integer or a decimal.)

a ≈ 22.06 m
(Do not round until the final answer. Then round to the nearest hundredth as needed.)

b ≈ 18.51 m
(Do not round until the final answer. Then round to the nearest hundredth as needed.)

10. Solve the triangle ABC.



B = 61 °
(Round to the nearest tenth as needed.)

C = 58 °
(Round to the nearest tenth as needed.)

The length of side c = 20.4 ft.
(Round to the nearest tenth as needed.)

11. This question has been removed from this assignment by your instructor; you have received full credit.

12. This question has been removed from this assignment by your instructor; you have received full credit.

13. Solve the following triangle.

A = 37°, C = 45°, c = 63 feet

B = 98 ° (Simplify your answer.)

a ≈ 53.6 feet
(Round to the nearest tenth as needed.)

b ≈ 88.2 feet
(Round to the nearest tenth as needed.)

14. Solve the following triangle.

B = 45°, C = 66°, b = 40 inches

A = 69 ° (Simplify your answer.)

a ≈ 52.8 inches
(Round to the nearest tenth as needed.)

c ≈ 51.7 inches
(Round to the nearest tenth as needed.)

15. This question has been removed from this assignment by your instructor; you have received full credit.

16. Solve the following triangle.

$A = 42.1^\circ$, $B = 42.4^\circ$, $c = 31$ meters

$C =$ 95.5 $^\circ$ (Simplify your answer. Type an integer or a decimal.)

$a \approx$ 20.9 meters
(Round to the nearest tenth as needed.)

$b \approx$ 21 meters
(Round to the nearest tenth as needed.)

17. Solve the SSA triangle. Indicate whether the given measurements result in no triangle, one triangle, or two triangles. Solve each resulting triangle. Round each answer to the nearest tenth.

$A = 37^\circ$ $a = 22$ $b = 15$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** There are two possible solutions for the triangle.
  The measurements for the solution with the longer side c are as follows.
  $B_1 =$ $^\circ$ $C_1 =$ $^\circ$ $c_1 =$
  The measurements for the solution with the shorter side c are as follows.
  $B_2 =$ $^\circ$ $C_2 =$ $^\circ$ $c_2 =$
  (Round to the nearest tenth as needed.)
- **B.** There is only one possible solution for the triangle.
  The measurements for the remaining angles B and C and side c are as follows.
  $B =$ 24.2 $^\circ$ $C =$ 118.8 $^\circ$ $c =$ 32
  (Round to the nearest tenth as needed.)
- **C.** There are no possible solutions for the triangle.

18. This question has been removed from this assignment by your instructor; you have received full credit.

19. Solve the following SSA triangle. Indicate whether the given measurements result in no triangle, one triangle, or two triangles. Solve each resulting triangle. Round each answer to the nearest tenth.

$A = 42^\circ$, $a = 12$, $b = 24$

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- **A.** There is only one possible solution for the triangle. The measurements for remaining angles B, C and side c are as follows.
  $B =$ $^\circ$, $C =$ $^\circ$, $c =$.
  (Type an integer or a decimal rounded to the nearest tenth as needed.)
- **B.** There are two possible solutions for the triangle. The measurements for the solution with the smaller side length c are as follows.
  $B_1 =$ $^\circ$, $C_1 =$ $^\circ$, $c_1 =$
  The measurements for the solution with the larger side length c are as follows.
  $B_2 =$ $^\circ$, $C_2 =$ $^\circ$, $c_2 =$
  (Type an integer or a decimal rounded to the nearest tenth as needed.)
- **C.** There are no possible solutions for the triangle.

20. Solve the SSA triangle. Indicate whether the given measurements result in no triangle, one triangle, or two triangles. Solve each resulting triangle. Round each answer to the nearest tenth.

$A = 117^\circ$ $a = 47$ $b = 34$

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- **A.** There is only one possible solution for the triangle.
  The measurements for the remaining angles B and C and side c are as follows.
  $B =$ 40.1 $^\circ$ $C =$ 22.9 $^\circ$ $c =$ 20.5
  (Round to the nearest tenth as needed.)
- **B.** There are two possible solutions for the triangle.
  The measurements for the solution with the longer side c are as follows.
  $B_1 =$ $^\circ$ $C_1 =$ $^\circ$ $c_1 =$
  The measurements for the solution with the shorter side c are as follows.
  $B_2 =$ $^\circ$ $C_2 =$ $^\circ$ $c_2 =$
  (Round to the nearest tenth as needed.)
- **C.** There are no possible solutions for this triangle.

21. Solve the following SSA triangle. Indicate whether the given measurements result in no triangle, one triangle, or two triangles. Solve each resulting triangle. Round each answer to the nearest tenth.

$B = 41^\circ$, $b = 11$, $c = 18$

Select the correct choice below and, if necessary, fill in the answer boxes to complete your choice.

- **A.** There is only one possible solution for the triangle. The measurements for remaining angles A, B and side b are as follows.
  A = ____ °, C = ____ °, a = ____ .
  (Type an integer or a decimal rounded to the nearest tenth as needed.)
- **B.** There are two possible solutions for the triangle. The measurements for the solution with the smaller side length a are as follows.
  A = ____ °, C = ____ °, a = ____
  The measurements for the solution with the larger side length a are as follows.
  A = ____ °, C = ____ °, a = ____
  (Type an integer or a decimal rounded to the nearest tenth as needed.)
- **C.** There are no possible solutions for the triangle. ✔

22. Solve the SSA triangle. Indicate whether the given measurements result in no triangle, one triangle, or two triangles. Solve each resulting triangle. Round each answer to the nearest tenth.

$B = 46^\circ$ $b = 31$ $c = 40$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** There is only one possible solution for the triangle.
  The measurements for the remaining angles A and C and side a are as follows.
  A = ____ ° C = ____ ° a = ____
  (Round to the nearest tenth as needed.)
- **B.** There are two possible solutions for the triangle. ✔
  The measurements for the solution with the longer side a are as follows.
  A_1 = 65.8 ° C_1 = 68.2 ° a_1 = 39.3
  The measurements for the solution with the shorter side a are as follows.
  A_2 = 22.2 ° C_2 = 111.8 ° a_2 = 16.3
  (Round to the nearest tenth as needed.)
- **C.** There are no possible solutions for the triangle.

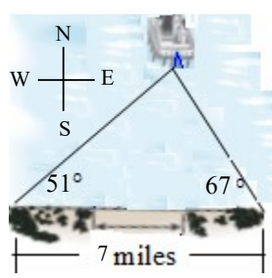
23. Solve the following SSA triangle. Indicate whether the given measurements result in no triangle, one triangle, or two triangles. Solve each resulting triangle. Round each answer to the nearest tenth.

$A = 45^\circ$, $a = 55$, $c = 62$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

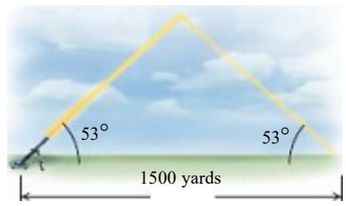
- **A.** There are 2 possible solutions for the triangle. ✔
  The measurements for the solution with the longer side b are as follows.
  B_1 = 82.1 ° C_1 = 52.9 ° The length of side b_1 = 77
  The measurements for the solution with the shorter side b are as follows.
  B_2 = 7.9 ° C_2 = 127.1 ° The length of side b_2 = 10.7
  (Type an integer or a decimal rounded to the nearest tenth as needed.)
- **B.** There is only 1 possible solution for the triangle.
  The measurements for the remaining angles B and C and side b are as follows.
  B = ____ ° C = ____ ° The length of side b = ____
  (Type an integer or a decimal rounded to the nearest tenth as needed.)
- **C.** There are no possible solutions for the triangle.

24. During a war, Country A led a massive assault on the beach of Country B. The beach is 7 miles long. At 5 AM, a ship was first spotted from either end of the beach. The angle made with the ship from one end of the beach was 51°. The angle made with the ship from the other end of the beach was 67°. Determine the distance from the ship to the west end of the beach at the moment the ship was first spotted.



The ship was about 7.3 miles from the west end when it was first spotted.
(Round to one decimal place as needed.)

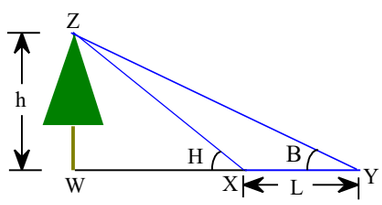
25. A laser beam with an angle of elevation of 53° is reflected by a target and is received 1500 yards from the point of origin. Assume that the trajectory of the beam forms (approximately) an isosceles triangle.
a. Find the total distance the beam travels.
b. What is the height of the target?



a. The total distance is 2492 yards.
(Do not round until the final answer. Then round to the nearest yard as needed.)

b. The height of the target is 995 yards.
(Do not round until the final answer. Then round to the nearest yard as needed.)

26. Pat needs to determine the height of a tree before cutting it down to be sure that it will not fall on a nearby fence. The angle of elevation of the tree from one position on a flat path from the tree is $H = 60^\circ$, and from a second position $L = 30$ feet farther along this path it is $B = 50^\circ$. What is the height of the tree?



The height of the tree is approximately 114.6 ft.
(Do not round until the final answer. Then round to the nearest tenth as needed.)

27. A flagpole 94.8 ft tall is on the top of a building. From a point on level ground, the angle of elevation of the top of the flagpole is 34.3°, while the angle of elevation of the bottom of the flagpole is 26.9°. Find the height of the building.

The building is about 275 ft tall.
(Round to the nearest foot as needed.)

28. The sides of a parallelogram are 14 m and 10 m, and the longer diagonal makes an angle of 18° with the longer side. Find the length of the longer diagonal.

The length of the longest diagonal is approximately 22.3 m.
(Round to one decimal place as needed.)

29. This question has been removed from this assignment by your instructor; you have received full credit.

30. This question has been removed from this assignment by your instructor; you have received full credit.