

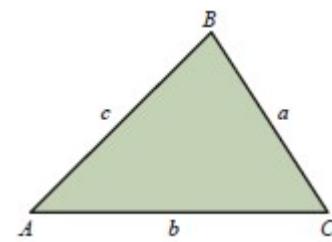
**Student:** Cole Lamers  
**Date:** 07/22/19

**Instructor:** Kelly Galarneau  
**Course:** CA&T Internet (70263)  
Galarneau

**Assignment:** 7.2 The Law of Cosines

1. Complete the following statement.

One form of law of cosines is  $c^2 = a^2 + b^2 - 2ab \cos (\underline{\hspace{2cm}})$



One form of law of cosines is  $c^2 = a^2 + b^2 - 2ab \cos (\underline{\hspace{2cm}} \quad C \quad \underline{\hspace{2cm}})$ .

2. Complete the sentence below.

If one side and two angles of any triangle are given, the \_\_\_\_\_ is used to solve the triangle.

If one side and two angles of any triangle are given, the Law of Sines is used to solve the triangle.

3. Decide whether the following statement is true or false.

For a triangle with SSS given, we can find angle A using the following formula.

$$A = \cos^{-1} \left( \frac{b^2 + c^2 - a^2}{2bc} \right)$$

Choose the correct answer below.

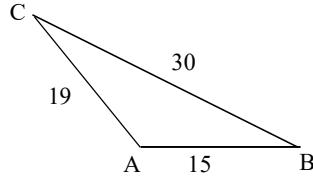
- False  
 True

4. If  $a = 6$ ,  $b = 3$ , and  $C = 60^\circ$  find  $c$  in the triangle ABC.

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

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

6. Solve the triangle given to the right.



$A = \underline{\hspace{2cm}} 123.4 \underline{\hspace{2cm}}^\circ$ ,  $B = \underline{\hspace{2cm}} 31.9 \underline{\hspace{2cm}}^\circ$ ,  $C = \underline{\hspace{2cm}} 24.7 \underline{\hspace{2cm}}^\circ$

(Round the final answers to one decimal place as needed. Round all intermediate values to four decimal places as needed.)

7. Solve the triangle.

$b = 2$ ,  $c = 6$ ,  $A = 160^\circ$

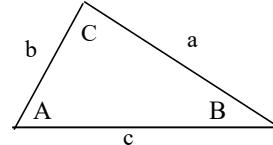
$a \approx \underline{\hspace{2cm}} 7.91 \underline{\hspace{2cm}}$  (Round to the nearest hundredth as needed.)

$B \approx \underline{\hspace{2cm}} 5 \underline{\hspace{2cm}}^\circ$  (Round to the nearest tenth as needed.)

$C \approx \underline{\hspace{2cm}} 15 \underline{\hspace{2cm}}^\circ$  (Round to the nearest tenth as needed.)

8. Solve the triangle.

$$a = 5, b = 10, C = 30^\circ$$



$$c \approx 6.2$$

(Round to two decimal places as needed.)

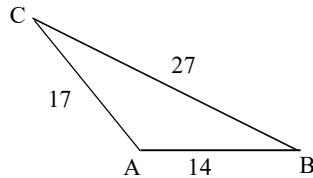
$$A \approx 23.8^\circ$$

(Type your answer in degrees. Round to one decimal place as needed.)

$$B \approx 126.2^\circ$$

(Type your answer in degrees. Round to one decimal place as needed.)

9. Solve the triangle given to the right.



$$A = 120.8^\circ, B = 32.7^\circ, C = 26.5^\circ$$

(Round the final answers to one decimal place as needed. Round all intermediate values to four decimal places as needed.)

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

11. Solve the triangle ABC.

$$a = 2.7 \quad b = 3.8 \quad c = 5.7$$

Find the unknown angle C, the angle opposite side c.

$$C = 121.6 \quad (\text{Round to the nearest tenth as needed.})$$

Find the unknown angle B, the angle opposite side b.

$$B = 34.6 \quad (\text{Round to the nearest tenth as needed.})$$

Find the unknown angle A, the angle opposite side a.

$$A = 23.8 \quad (\text{Round to the nearest tenth as needed.})$$

12. Solve the triangle ABC.

$$a = 3.4 \quad c = 4.7 \quad B = 68.5$$

Find the unknown side b, the side opposite angle B.

$$b = 4.7 \quad (\text{Round to the nearest tenth as needed.})$$

Find the unknown angle C, the angle opposite side c.

$$C = 68.5^\circ \quad (\text{Round to the nearest tenth as needed.})$$

Find the unknown angle A, the angle opposite side a.

$$A = 43^\circ \quad (\text{Round to the nearest tenth as needed.})$$

13. Find the length of the chord intercepted by a central angle of  $15^\circ$  in a circle of radius 25 feet.

The chord length is approximately 6.5 feet.

(Round to the nearest tenth as needed.)

14. A tunnel is planned through a mountain to connect points A and B on two existing roads. If the angle between the roads at point C is  $64^\circ$ , the distance between points A and C is 2200 ft, and the distance between points B and C is 2000 ft, what is the distance from point A to point B?

What is the distance from point A to point B?

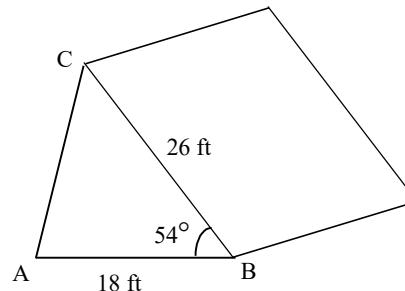
$$2232.1 \quad \text{ft}$$

(Do not round until the final answer. Then 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. A roof of a house addition is being built as shown in the figure.

- a. Find the length of the edge AC of the truss.  
 b. Find the measure of  $\angle BAC$



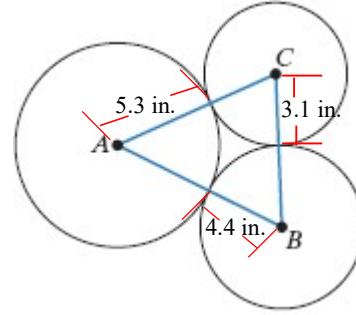
a. The length of the edge AC is approximately  ft.  
 (Round to one decimal place as needed.)

b. The measure of  $\angle BAC$  is approximately  °.  
 (Round to one decimal place as needed.)

17. Two hikers, Sonia and Tony, leave the same point at the same time. Sonia walks due east at the rate of 4 miles per hour, and Tony walks  $45^\circ$  northeast at the rate of 3.2 miles per hour. How far apart are the hikers after three hours?

After three hours, the hikers are  miles apart.  
 (Type an integer or a decimal rounded to one decimal place as needed.)

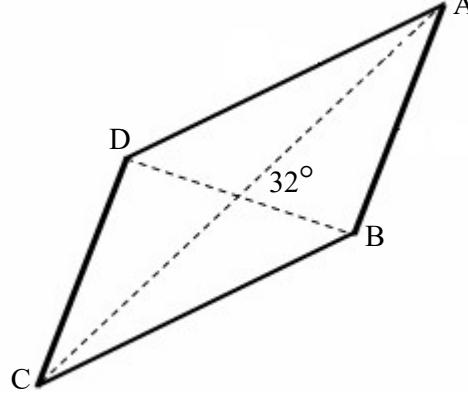
18. An engineer wants to position three pipes at the vertices of a triangle as shown in the figure to the right. If the pipes have radii 5.3 in., 4.4 in., and 3.1 in., then what are the measures of the angles of triangle ABC?



$$A = 48^\circ, B = 57^\circ, \text{ and } C = 75^\circ$$

(Do not round until the final answer. Then round to the nearest degree as needed.)

19. The lengths of the diagonals of a parallelogram are  $AC = 22$  cm and  $BD = 28$  cm. The diagonals intersect at an angle of  $32^\circ$ . Find the lengths of the parallelogram's sides. (Hint: Diagonals of a parallelogram bisect one another.)



The length of the short side AB is  cm.

(Do not round until the final answer. Then round to the nearest tenth as needed.)

The length of the long side BC is  cm.

(Do not round until the final answer. Then round to the nearest tenth as needed.)

The length of the short side CD is  cm.

(Do not round until the final answer. Then round to the nearest tenth as needed.)

The length of the long side DA is  cm.

(Do not round until the final answer. Then round to the nearest tenth as needed.)

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

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