

Practice

Student Edition
Pages 772-779**An Introduction to Trigonometry**

Using the triangle shown, write an equation involving \sin , \cos , or \tan that can be used to find the missing measure. Then solve the equation. Round measures of sides to the nearest tenth.

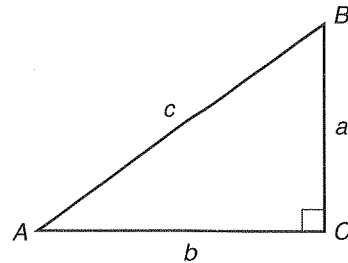
1. If $A = 20^\circ$ and $c = 32$, find a .

2. If $A = 49^\circ$ and $a = 17$, find b .

3. If $A = 27.3^\circ$ and $a = 7$, find c .

4. If $a = 19.2$ and $A = 63.4^\circ$, find b .

5. If $a = 28$ and $B = 41^\circ$, find c .



Solve each right triangle. Assume that C represents the right angle and c is the hypotenuse. Round measures of sides and angles to the nearest tenth.

6. $a = 12$, $A = 35^\circ$

7. $b = 25$, $B = 71^\circ$

8. $a = 4$, $b = 7$

9. $b = 52$, $c = 95$

Solve each problem. Round measures of lengths to the nearest tenth.

10. An airplane is directly above a beacon that is 10,000 feet from an airport control tower. The angle of depression from the plane to the base of the control tower is 6° . How high above the beacon is the plane?
11. John views the top of a water tower at an angle of elevation of 36° . He walks 120 meters in a straight line toward the tower. Then he sights the top of the tower at an angle of elevation of 51° . How far is John from the base of the tower?

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Using the triangle shown, write an equation involving \sin , \cos , or \tan that can be used to find the missing measure. Then solve the equation. Round measures of sides to the nearest tenth.

1. If
- $A = 20^\circ$
- and
- $c = 32$
- , find
- a
- .

$$\sin 20^\circ = \frac{a}{32}; 10.9$$

2. If
- $A = 49^\circ$
- and
- $a = 17$
- , find
- b
- .

$$\tan 49^\circ = \frac{17}{b}; 14.8$$

3. If
- $A = 27.3^\circ$
- and
- $a = 7$
- , find
- c
- .

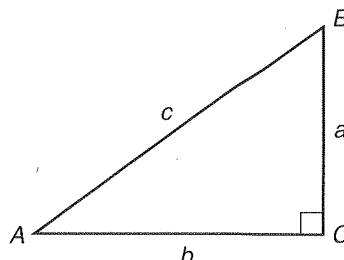
$$\sin 27.3^\circ = \frac{7}{c}; 15.3$$

4. If
- $a = 19.2$
- and
- $A = 63.4^\circ$
- , find
- b
- .

$$\tan 63.4^\circ = \frac{19.2}{b}; 9.6$$

5. If
- $a = 28$
- and
- $B = 41^\circ$
- , find
- c
- .

$$\cos 41^\circ = \frac{28}{c}; 37.1$$



Solve each right triangle. Assume that C represents the right angle and c is the hypotenuse. Round measures of sides and angles to the nearest tenth.

- 6.
- $a = 12, A = 35^\circ$

$$B = 55^\circ, b = 17.1, c = 20.9$$

- 7.
- $b = 25, B = 71^\circ$

$$A = 19^\circ, a = 8.6, c = 26.4$$

- 8.
- $a = 4, b = 7$

$$A = 29.6^\circ, B = 60.3^\circ, c = 8.1$$

- 9.
- $b = 52, c = 95$

$$a = 79.5, A = 56.8^\circ, B = 33.2^\circ$$

Solve each problem. Round measures of lengths to the nearest tenth.

10. An airplane is directly above a beacon that is 10,000 feet from an airport control tower. The angle of depression from the plane to the base of the control tower is 6° . How high above the beacon is the plane?
1051.0 feet

11. John views the top of a water tower at an angle of elevation of 36° . He walks 120 meters in a straight line toward the tower. Then he sights the top of the tower at an angle of elevation of 51° . How far is John from the base of the tower?
171.5 meters

Practice

Law of Sines

Find the area of each triangle described below. Round answers to the nearest tenth.

1. $a = 9, b = 11, C = 46^\circ$

2. $a = 12, c = 15, B = 58^\circ$

3. $b = 9, c = 9, A = 40^\circ$

4. $a = 12.6, b = 8.9, C = 32^\circ$

5. $a = 14.9, c = 18.6, B = 27^\circ$

6. $b = 19.4, c = 8.6, A = 34^\circ$

7. $a = 9, b = 7, C = 26.1^\circ$

8. $b = 12, c = 19, A = 46.4^\circ$

9. $a = 12, c = 14, B = 56.5^\circ$

10. $b = 12, c = 14, A = 17.4^\circ$

Solve each triangle described below. Round measures of sides and angles to the nearest tenth.

11. $A = 50^\circ, B = 30^\circ, c = 9$

12. $a = 12, A = 56^\circ, B = 38^\circ$

13. $a = 14, b = 18, A = 36.8^\circ$

14. $b = 20, c = 25, C = 70.2^\circ$

15. $a = 25, b = 30, A = 46.3^\circ$

16. $a = 40, A = 80.2^\circ, C = 14.2^\circ$

17. $A = 80^\circ, C = 40^\circ, c = 30$

18. $c = 42, b = 56, C = 43.5^\circ$

19. $b = 13, B = 46.6^\circ, C = 112^\circ$

20. $A = 110^\circ, a = 20, b = 8$

Practice

Law of Sines

Find the area of each triangle described below. Round answers to the nearest tenth.

1. $a = 9, b = 11, C = 46^\circ$
35.6

2. $a = 12, c = 15, B = 58^\circ$
76.3

3. $b = 9, c = 9, A = 40^\circ$
26.0

4. $a = 12.6, b = 8.9, C = 32^\circ$
29.7

5. $a = 14.9, c = 18.6, B = 27^\circ$
62.9

6. $b = 19.4, c = 8.6, A = 34^\circ$
46.7

7. $a = 9, b = 7, C = 26.1^\circ$
13.9

8. $b = 12, c = 19, A = 46.4^\circ$
82.6

9. $a = 12, c = 14, B = 56.5^\circ$
70.0

10. $b = 12, c = 14, A = 17.4^\circ$
25.1

Solve each triangle described below. Round measures of sides and angles to the nearest tenth.

11. $A = 50^\circ, B = 30^\circ, c = 9$
 $C = 100^\circ, a = 7.0, b = 4.6$

12. $a = 12, A = 56^\circ, B = 38^\circ$
 $C = 86^\circ, b = 8.9, c = 14.4$

13. $a = 14, b = 18, A = 36.8^\circ$
 $B = 50.4^\circ, C = 92.8^\circ, c = 23.3$

14. $b = 20, c = 25, C = 70.2^\circ$
 $B = 48.8^\circ, A = 61.0^\circ, a = 23.2$

15. $a = 25, b = 30, A = 46.3^\circ$
 $B = 60.2^\circ, C = 73.5^\circ, c = 33.2$

16. $a = 40, A = 80.2^\circ, C = 14.2^\circ$
 $B = 85.6^\circ, b = 40.5, c = 10.0$

17. $A = 80^\circ, C = 40^\circ, c = 30$
 $B = 60^\circ, a = 46.0, b = 40.4$

18. $c = 42, b = 56, C = 43.5^\circ$
 $B = 66.6^\circ, A = 69.9^\circ, a = 57.3$

19. $b = 13, B = 46.6^\circ, C = 112^\circ$
 $A = 21.4^\circ, a = 6.5, c = 16.6$

20. $A = 110^\circ, a = 20, b = 8$
 $B = 22.1^\circ, C = 47.9^\circ, c = 15.8$