

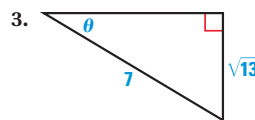
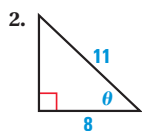
13 CHAPTER TEST

Evaluate the six trigonometric functions of the angle θ .

$$\begin{aligned} 1. \sin \theta &= \frac{4\sqrt{97}}{97}, \\ \cos \theta &= \frac{9\sqrt{97}}{97}, \\ \tan \theta &= \frac{4}{9}, \csc \theta = \frac{9\sqrt{97}}{4}, \\ \sec \theta &= \frac{9\sqrt{97}}{9}, \cot \theta = \frac{9}{4} \end{aligned}$$

$$\begin{aligned} 2. \sin \theta &= \frac{\sqrt{57}}{11}, \\ \cos \theta &= \frac{8}{11}, \\ \tan \theta &= \frac{\sqrt{57}}{8}, \\ \csc \theta &= \frac{11\sqrt{57}}{57}, \\ \sec \theta &= \frac{11}{8}, \\ \cot \theta &= \frac{8\sqrt{57}}{57} \end{aligned}$$

$$\begin{aligned} 3. \sin \theta &= \frac{\sqrt{13}}{7}, \\ \cos \theta &= \frac{6}{7}, \\ \tan \theta &= \frac{\sqrt{13}}{6}, \\ \csc \theta &= \frac{7\sqrt{13}}{13}, \\ \sec \theta &= \frac{7}{6}, \\ \cot \theta &= \frac{6\sqrt{13}}{13} \end{aligned}$$



Convert the degree measure to radians or the radian measure to degrees.

$$\begin{aligned} 4. 260^\circ &= \frac{13\pi}{9} & 5. -50^\circ &= -\frac{5\pi}{18} & 6. \frac{4\pi}{5} &= 144^\circ & 7. \frac{8\pi}{3} &= 480^\circ \end{aligned}$$

Evaluate the function without using a calculator.

$$\begin{aligned} 8. \tan 150^\circ &= -\frac{\sqrt{3}}{3} & 9. \sec(-480^\circ) &= -2 & 10. \sin\left(-\frac{5\pi}{3}\right) &= \frac{\sqrt{3}}{2} & 11. \cos \frac{11\pi}{6} &= \frac{\sqrt{3}}{2} \end{aligned}$$

Evaluate the expression in both radians and degrees without using a calculator.

$$\begin{aligned} 12. \cos^{-1} 1 &= 0, 0^\circ & 13. \tan^{-1} \sqrt{3} &= \frac{\pi}{3}, 60^\circ & 14. \sin^{-1}\left(-\frac{\sqrt{2}}{2}\right) &= -\frac{\pi}{4}, -45^\circ & 15. \cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) &= \frac{5\pi}{6}, 150^\circ \end{aligned}$$

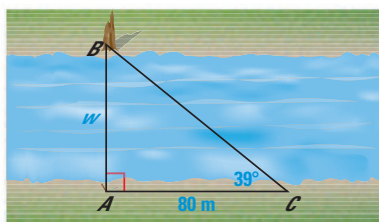
Solve $\triangle ABC$. (Hint: Some of the “triangles” may have no solution and some may have two solutions.)

$$\begin{aligned} 16. A &= 47^\circ, C = 32^\circ, c = 12 & 17. a &= 24, b = 12, c = 17 \\ B &= 101^\circ, a \approx 16.6, b \approx 22.2 & A &\approx 110.5^\circ, B \approx 27.9^\circ, C \approx 41.6^\circ \\ 18. B &= 63^\circ, a = 11, b = 8 & C &= 101^\circ, a = 23, b = 19 \\ &\text{no triangle} & A &\approx 44.0^\circ, B \approx 35.0^\circ, C \approx 32.5^\circ \\ 20. a &= 24, b = 30, c = 21 & 21. A &= 26^\circ, B = 77^\circ, c = 50 \\ A &\approx 52.6^\circ, B \approx 83.3^\circ, C \approx 44.1^\circ & C &= 77^\circ, a \approx 22.5, b = 50 \end{aligned}$$

Find the area of $\triangle ABC$.

$$\begin{aligned} 22. A &= 81^\circ, b = 16, c = 18 & \text{about } 142.2 & 23. a &= 8, b = 6, c = 7 & \text{about } 20.3 \\ 24. a &= 25, b = 24, c = 38 & \text{about } 293.8 & 25. C &= 111^\circ, a = 7, b = 13 & \text{about } 42.5 \\ 26. a &= 16, b = 33, c = 24 & \text{about } 180.9 & 27. B &= 61^\circ, a = 12, c = 18 & \text{about } 94.5 \end{aligned}$$

28. **SURVEYING** To measure the width of a river, you plant a stake at point A on one side of the riverbank, directly across from a tree stump at point B on the other side of the riverbank. From point A, you walk 80 meters along the riverbank to point C. You find the measure of angle C to be 39° . What is the width w of the river? **about 64.8 m**



29. **CONSTRUCTION** A crane has a 200 foot arm with a lower end that is 5 feet off the ground. The arm has to reach to the top of a building that is 160 feet high. At what angle θ should the arm be set? **about 50.8°**

30. **NAVIGATION** A boat travels 40 miles due west before turning 20° and traveling an additional 25 miles. How far is the boat from its point of departure? **about 64.1 mi**

Additional Resources

Assessment Book

- Chapter Test, Levels A, B, C, pp. 185–190
- Standardized Chapter Test, pp. 191–192
- SAT/ACT Chapter Test, pp. 193–194
- Alternative Assessment, pp. 195–196

Test Generator CD-ROM

Chapter Test

Easily-readable reduced copies (with answers) of Chapter Test B, the Standardized Chapter Test, and the Alternative Assessment from the Assessment Book can be found on pp. 850E–850F.