

## Chapter 13

**13.1** Let  $\theta$  be an acute angle of a right triangle. Find the values of the other five trigonometric functions of  $\theta$ .

1.  $\sin \theta = \frac{3}{5}$

2.  $\tan \theta = \frac{8}{15}$

3.  $\sec \theta = 2$

4.  $\cos \theta = \frac{\sqrt{7}}{4}$

**13.1** Solve  $\triangle ABC$  using the diagram and the given measurements.

5.  $A = 21^\circ, c = 8$

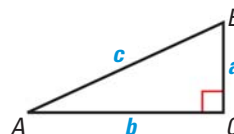
6.  $B = 66^\circ, a = 14$

7.  $B = 60^\circ, c = 20$

8.  $A = 29^\circ, b = 6$

9.  $A = 18^\circ, c = 18$

10.  $B = 56^\circ, c = 7$



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

11.  $100^\circ$

12.  $-6^\circ$

13.  $\frac{3\pi}{4}$

14.  $-\frac{\pi}{6}$

**13.2** Find the arc length and area of a sector with the given radius  $r$  and central angle  $\theta$ .

15.  $r = 5$  ft,  $\theta = 90^\circ$

16.  $r = 2$  in.,  $\theta = 300^\circ$

17.  $r = 12$  cm,  $\theta = \pi$

**13.3** Sketch the angle. Then find its reference angle.

18.  $250^\circ$

19.  $-30^\circ$

20.  $\frac{8\pi}{3}$

21.  $-\frac{11\pi}{6}$

**13.3** Evaluate the function without using a calculator.

22.  $\sin(-60^\circ)$

23.  $\csc 240^\circ$

24.  $\tan \frac{7\pi}{4}$

25.  $\cos\left(-\frac{5\pi}{4}\right)$

**13.4** Evaluate the expression without using a calculator. Give your answer in both radians and degrees.

26.  $\sin^{-1} 0$

27.  $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

28.  $\cos^{-1} 3$

29.  $\tan^{-1} 1$

**13.4** Solve the equation for  $\theta$ .

30.  $\sin \theta = 0.25; 90^\circ < \theta < 180^\circ$

31.  $\cos \theta = 0.9; 270^\circ < \theta < 360^\circ$

32.  $\tan \theta = 2; 180^\circ < \theta < 270^\circ$

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

33.  $A = 34^\circ, a = 6, b = 7$

34.  $A = 50^\circ, C = 65^\circ, b = 60$

35.  $B = 86^\circ, b = 13, c = 11$

**13.5** Find the area of  $\triangle ABC$  with the given side lengths and included angle.

36.  $A = 35^\circ, b = 50, c = 120$

37.  $B = 35^\circ, a = 7, c = 12$

38.  $C = 20^\circ, a = 10, b = 16$

**13.6** Solve  $\triangle ABC$ .

39.  $a = 16, b = 23, c = 17$

40.  $C = 50^\circ, a = 12, b = 14$

41.  $A = 80^\circ, b = 7, c = 5$

**13.6** Find the area of  $\triangle ABC$  with the given side lengths.

42.  $a = 6, b = 3, c = 4$

43.  $a = 14, b = 30, c = 27$

44.  $a = 16, b = 16, c = 20$