

Chapter VII topics:

- Radian and degree measure.
- Trigonometric functions and right triangles.
- Trigonometric functions and the unit circle.
- Graphs of Sine and Cosine functions.
- Graphs of other trigonometric functions.
- Inverse trigonometric functions.

Chapter VIII topics:

- Fundamental trigonometric identities.
- Sum and difference identities.
- Product-sum identities.
- Trigonometric equations.

Chapter IX topics:

- The Law of Sines.
- The Law of Cosines.

1. Convert the radian measure to degrees.

(a) $\frac{7\pi}{20}$

(b) $\frac{-9\pi}{4}$

2. Convert the degree measure to radians.

(a) 154°

(b) 480°

(c) -144°

3. Problems 1-14 (textbook, pp.527-528).

4. Find $\cos \theta$ if $\sec \theta = -7/4$.

5. Determine the point (x, y) on the unit circle associated with each real number s .

(a) $s = \frac{\pi}{6}$

(b) $s = -120^\circ$

6. Determine all real numbers s associated with each point (x, y) on the unit circle.

(a) $(x, y) = (1/2, -\sqrt{3}/2)$

7. Determine the values of the six trigonometric functions of the given angle θ .

(a) $\theta = \frac{5\pi}{2}$

8. Determine the reference angle associated with the given angle.

(a) $\theta = \frac{5\pi}{4}$

9. Given that $\cot \theta = \frac{3}{4}$ and $\sin \theta$ is negative, determine $\sec \theta$.

10. Determine the amplitude, period, frequency, and phase shift of the following functions.

(a) $f(x) = -3 \cos(x + 7)$

(b) $0.5 \sin(8x + 1)$

11. Sketch the graph of each of the following functions.

(a) $f(x) = 2 \sin(x - \pi/4)$

(b) $g(x) = 2 - \cos(2\pi x)$

12. Sketch the graph of the following functions

(a) $f(x) = \frac{1}{3} \csc(2x)$

(b) $g(x) = 1 - \cot(x - \pi/2)$

13. Evaluate each of the following expressions without the use of a calculator.

(a) $\cos^{-1}(\sqrt{2}/2)$

(b) $\cot^{-1}(-\sqrt{3})$

14. Find the value of each of the following expressions without using a calculator.

(a) $\sin(\arctan(\sqrt{3}))$

(b) $\sec(\arcsin(-1/2))$

15. Use trigonometric identities to simplify the expressions.

(a) $\sin(-x) \tan x$

(b) $\cot^2 x - \cot^2 x \cos^2 x$

(c) $\frac{1}{\cos x \csc(-x)}$

16. Use the sum and difference identities to determine the exact value of each of the following expressions.

(a) $\sin\left(\frac{2\pi}{3} + \frac{\pi}{4}\right)$

(b) $\tan 75^\circ$

17. Use the sum and difference identities to rewrite each of the following expressions as a trigonometric function of one angle, and then evaluate the result.

(a) $\sin 15^\circ \cos 30^\circ + \cos 15^\circ \sin 30^\circ$

18. Rewrite $\sin^3 x$ in terms containing only first powers of sine and cosine.

19. Determine the exact value of the following expression

$$\sin(3\pi/8)$$

20. Use the product-to-sum identities to rewrite the given expression as a sum or difference

$$\sin(3x) \cos(3x)$$

21. Use trigonometric identities and algebraic methods, as necessary, to solve the following trigonometric equations

(a) $4 \cos x = 2$

(b) $\sec x + \tan x = 1$

22. Use trigonometric identities and algebraic methods, as necessary, to solve the following trigonometric equations on the interval $[0, 2\pi)$

(a) $\tan^2 x = \tan x + 6$

(b) $12 \sin x - 16 = -11 + 18 \sin x$

23. Solve for the remaining angle and sides of the triangle (Law of Sines)

(a) $A = 30^\circ, B = 45^\circ, a = 3$

(b) $A = 100^\circ, B = 20^\circ, b = 1$

24. Solve for the remaining angle and sides of the triangle (Law of Cosines)

(a) $A = 40^\circ, b = 2, c = 3$

(b) $B = 100^\circ, a = 1, c = 3$

25. Solve for the angles of the given triangles.

$$a = 3, \quad b = 4, \quad c = 2$$