

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

The given angle is in standard position. Determine the quadrant in which the angle lies.

1) -298°



1) I

2) -153°



2) III

Find the radian measure of the central angle of a circle of radius r that intercepts an arc of length s .

3) $r = 7$ inches, $s = 21$ inches

$21 = 7\theta$ $\theta = 3$ radians

3) 3 radians

Convert the angle in degrees to radians. Express answer as a multiple of π .

4) 105°

$\frac{105}{180} \pi = .58 \pi$ radians

$\frac{105\pi}{180} = \frac{21\pi}{36} = \frac{7\pi}{12}$

4) $\frac{7}{12}\pi$ radians

Convert the angle in radians to degrees.

5) $-\frac{19}{6}\pi$

$-3\frac{1}{6}\pi \left| \frac{180^\circ}{\pi} \right. = -569.99 \approx -570$

5) -570°

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Draw the angle in standard position.

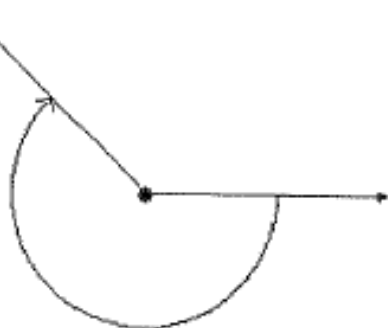
6) $-\frac{3\pi}{4}$

6) _____

A)



B)



C



D)



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find a positive angle less than 360° or 2π that is coterminal with the given angle.

7) -14°

$360 - 14 = 346^\circ$

7) 346°



8) 549°



8) 189°

Find the length of the arc on a circle of radius r intercepted by a central angle θ . Round answer to two decimal places.

9) $r = 50$ inches, $\theta = 25^\circ$

$$s = r\theta = (50)(25) = \frac{1250^\circ}{180^\circ} \cdot \pi = 6.94\pi \text{ rad} = 21.80$$

9) 21.80

Solve the problem.

10) The minute hand of a clock is 7 inches long. How far does the tip of the minute hand move in 5 minutes? If necessary, round the answer to two decimal places. 10) _____

11) A car wheel has a 13-inch radius. Through what angle (to the nearest tenth of a degree) does the wheel turn when the car rolls forward 5 ft? 11) _____

12) A car is traveling at 46 mph. If its tires have a diameter of 24 inches, how fast are the car's tires turning? Express the answer in revolutions per minute. If necessary, round to two decimal places. 12) _____

The point $P(x, y)$ on the unit circle that corresponds to a real number t is given. Find the value of the indicated trigonometric function at t .

13) $\left(\frac{2}{5}, \frac{\sqrt{21}}{5}\right)$ Find $\tan t$. 13) _____

14) $\left(\frac{\sqrt{55}}{8}, \frac{3}{8}\right)$ Find $\sec t$. 14) _____

Solve the problem.

15) What is the domain of the cosine function? 15) _____

16) What is the range of the sine function? 16) _____

$\sin t$ and $\cos t$ are given. Use identities to find the indicated value. Where necessary, rationalize denominators.

17) $\sin t = -\frac{5}{7}$, $\cos t = \frac{-2\sqrt{6}}{7}$. Find $\csc t$. 17) _____

18) $\sin t = -\frac{\sqrt{7}}{4}$, $\cos t = \frac{3}{4}$. Find $\cot t$. 18) _____

$0 \leq t < \frac{\pi}{2}$ and $\sin t$ is given. Use the Pythagorean identity $\sin^2 t + \cos^2 t = 1$ to find $\cos t$.

19) $\sin t = \frac{2\sqrt{2}}{3}$ 19) _____

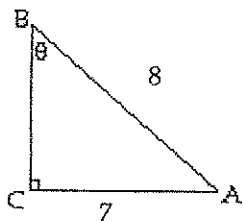
$0 \leq t < \frac{\pi}{2}$ and $\cos t$ is given. Use the Pythagorean identity $\sin^2 t + \cos^2 t = 1$ to find $\sin t$.

20) $\cos t = \frac{\sqrt{77}}{9}$ 20) _____

Use the Pythagorean Theorem to find the length of the missing side. Then find the indicated trigonometric function of the given angle. Give an exact answer with a rational denominator.

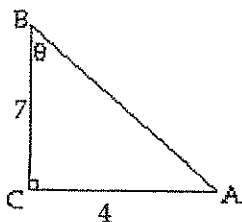
21) Find $\sin \theta$.

21) _____

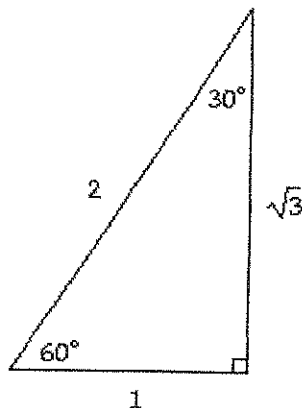
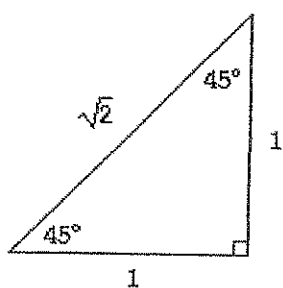


22) Find $\csc \theta$.

22) _____



Use the given triangles to evaluate the expression. Rationalize all denominators.



23) $\tan \frac{\pi}{4} - \sin \frac{\pi}{4}$

23) _____

24) $\cot \frac{\pi}{3} - \cos \frac{\pi}{6}$

24) _____

Find a cofunction with the same value as the given expression.

25) $\sin 33^\circ$

25) _____

Solve the problem.

26) A building 160 feet tall casts a 40 foot long shadow. If a person stands at the end of the shadow and looks up to the top of the building, what is the angle of the person's eyes to the top of the building (to the nearest hundredth of a degree)? (Assume the person's eyes are 5 feet above ground level.)

26) _____

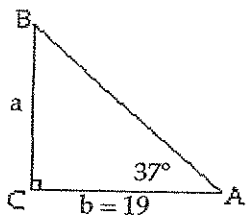
27) A straight trail with a uniform inclination of 18° leads from a lodge at an elevation of 700 feet to a mountain lake at an elevation of 9300 feet. What is the length of the trail (to the nearest foot)?

27) _____

Find the measure of the side of the right triangle whose length is designated by a lowercase letter. Round your answer to the nearest whole number.

28)

28) _____



A point on the terminal side of angle θ is given. Find the exact value of the indicated trigonometric function of θ .

29) $(-10, 24)$ Find $\sin \theta$.

29) _____

30) $(-3, -4)$ Find $\sec \theta$.

30) _____

Find the exact value of the indicated trigonometric function of θ .

31) $\sec \theta = \frac{9}{4}$, θ in quadrant IV Find $\tan \theta$.

31) _____

32) $\cos \theta = \frac{8}{17}$, $\frac{3\pi}{2} < \theta < 2\pi$ Find $\cot \theta$.

32) _____

Find the reference angle for the given angle.

33) -79°

33) _____

34) $\frac{23\pi}{3}$

34) _____

Answer Key

Testname: CHAPTER 4.1-4.4 STUDY GUIDE

- 1) Quadrant I
- 2) Quadrant III
- 3) 3 radians
- 4) $\frac{7\pi}{12}$ radians
- 5) -570°
- 6) C
- 7) 346°
- 8) 189°
- 9) 21.82 inches
- 10) 3.67 inches
- 11) 264.4°
- 12) 644.26 revolutions per minute
- 13) $\frac{\sqrt{21}}{2}$
- 14) $\frac{8\sqrt{55}}{55}$
- 15) all real numbers
- 16) all real numbers from -1 to 1, inclusive
- 17) $-\frac{7}{5}$
- 18) $\frac{-3\sqrt{7}}{7}$
- 19) $\frac{1}{3}$
- 20) $\frac{2}{9}$
- 21) $\frac{7}{8}$
- 22) $\frac{\sqrt{65}}{4}$
- 23) $\frac{2-\sqrt{2}}{2}$
- 24) $-\frac{\sqrt{3}}{6}$
- 25) $\cos 57^\circ$
- 26) 75.53°
- 27) 27,830 feet
- 28) $a = 14$ cm
- 29) $\frac{12}{13}$
- 30) $-\frac{5}{3}$
- 31) $-\frac{\sqrt{65}}{4}$

Answer Key

Testname: CHAPTER 4.1-4.4 STUDY GUIDE

32) $-\frac{8}{15}$

33) 79°

34) $\frac{\pi}{3}$