Multiple Choice

____ 1. Find the exact value of $\cos 150°$.

a. $-\frac{\sqrt{2}}{2}$
b. $-\frac{\sqrt{2}}{3}$
c. $-\frac{\sqrt{3}}{2}$
d. $\frac{\sqrt{2}}{2}$
e. $\frac{\sqrt{3}}{2}$

____ 2. Find the exact value of $\tan 480°$.

a. $\sqrt{3}$
b. $\frac{\sqrt{3}}{3}$
c. $\frac{\sqrt{3}}{2}$
d. $-\sqrt{3}$
e. $-\frac{\sqrt{3}}{2}$

____ 3. Use a calculator to find $\tan 142.7°$.

Please round the answer to the nearest ten-thousandth.

a. –0.7508
b. –0.7318
c. –0.7618
d. –0.7218
e. –0.7617

____ 4. Use a calculator to find $\csc 640°20'$.

Please round the answer to the nearest ten-thousandth.

a. –0.9965
b. –1.0166
c. –1.0165
d. –1.0365
e. –1.0192

____ 5. Use a calculator to find θ to the nearest tenth of a degree, if $0° < \theta < 360°$ and $\sin\theta = -0.3040$ with θ in QIII.

a. $196.7°$
b. $194.2°$
c. $197.7°$
d. $195.4°$
e. $200.7°$

____ 6. Use a calculator to find θ to the nearest tenth of a degree, if $0° < \theta < 360°$ and $\sec\theta = -3.4110$ with θ in QII.

a. $103.5°$
b. $104.7°$
c. $106.0°$
d. $107.0°$
e. $110.0°$

____ 7. Convert to radian measure using exact values.

$\theta = 200°$

a. $\frac{11\pi}{9}$
b. $\frac{10\pi}{9}$
c. $\frac{7\pi}{6}$
d. $\frac{14\pi}{9}$
e. $\frac{7\pi}{4}$

____ 8. Name the reference angle in both degrees and radians.

$\theta = 135°$

a. $20° = \frac{\pi}{9}$
b. $-45° = -\frac{\pi}{4}$
c. $-20° = -\frac{\pi}{9}$
d. $45° = \frac{\pi}{4}$
e. $30° = \frac{\pi}{6}$

____ 9. Use a calculator to convert $170° 50'$ to radians. Round your answer to the nearest hundredth. (First convert to decimal degrees, then multiply by the appropriate conversion factor to convert to radians.)

a. 2.96
b. 2.98
c. 3.02
d. 3.06
e. 2.92

____ 10. Label the reference angle in both degrees and radians.

$\theta = \frac{13\pi}{6}$

a. $30° = \frac{\pi}{12}$
b. $15° = \frac{\pi}{12}$
c. $20° = \frac{\pi}{9}$
d. $15° = \frac{\pi}{6}$
e. $30° = \frac{\pi}{6}$

____ 11. Give the exact value of $2\cos\left(-\frac{3\pi}{4}\right)$.

a. $\sqrt{3}$
b. $-2\sqrt{2}$
c. $-\sqrt{2}$
d. $2\sqrt{2}$
e. $\sqrt{2}$

____ 12. If angle θ is in standard position and intersects the unit circle at $(\frac{5}{\sqrt{41}}, -\frac{4}{\sqrt{41}})$ find $\sin\theta$, $\cos\theta$ and $\tan\theta$.

a. $\sin\theta = -\frac{4}{\sqrt{41}}$, $\cos\theta = \frac{5}{\sqrt{41}}$, $\tan\theta = -\frac{4}{5}$

b. $\sin\theta = \frac{5}{\sqrt{41}}$, $\cos\theta = -\frac{4}{\sqrt{41}}$, $\tan\theta = -\frac{5}{4}$

c. $\sin\theta = \frac{5}{\sqrt{41}}$, $\cos\theta = -\frac{4}{\sqrt{41}}$, $\tan\theta = -\frac{4}{5}$

d. $\sin\theta = -\frac{5}{\sqrt{41}}$, $\cos\theta = \frac{4}{\sqrt{41}}$, $\tan\theta = -\frac{4}{5}$

e. $\sin\theta = -\frac{4}{\sqrt{41}}$, $\cos\theta = \frac{5}{\sqrt{41}}$, $\tan\theta = -\frac{5}{4}$

____ 13. Graph the unit circle using parametric equations with your calculator set to radian mode. Use a scale of $\frac{\pi}{12}$. Trace the circle to find the sine and cosine of $\frac{4\pi}{3}$ to the nearest ten-thousandth.

a. $\sin\frac{4\pi}{3} = 0.866$
$\cos\frac{4\pi}{3} = 0.5$

b. $\sin\frac{4\pi}{3} = 0.866$
$\cos\frac{4\pi}{3} = -0.4$

c. $\sin\frac{4\pi}{3} = 0.666$
$\cos\frac{4\pi}{3} = 0.4$

d. $\sin\frac{4\pi}{3} = 0.666$
$\cos\frac{4\pi}{3} = -0.4$

e. $\sin\frac{4\pi}{3} = -0.866$
$\cos\frac{4\pi}{3} = -0.5$

____ 14. For the problem below, θ is a central angle in a circle of radius r. Find the length of arc s cut off by θ.

$\theta = 330°, r = 5$ inches.

a. s = 30 inches
b. s = 32 inches
c. s = 26.8 inches
d. s = 28.8 inches
e. s = 29.8 inches

____ 15. **Arc length** The minute hand of a clock is 1.1 centimeters long. How far does the tip of the minute hand travel in 40 minutes?

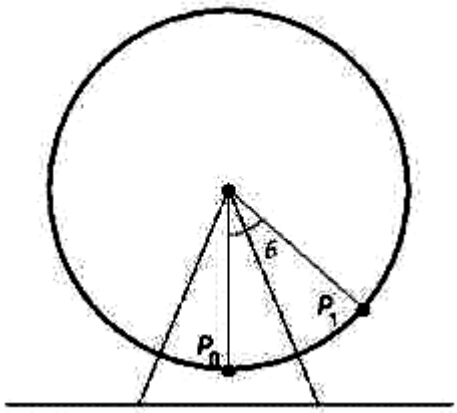
Round to three significant digits.

a. 4.41 centimeters
b. 5.01 centimeters
c. 4.51 centimeters
d. 4.91 centimeters
e. 4.61 centimeters

____ 16. If the distance to the sun is approximately 93 million miles, and, from the earth, the sun subtends an angle of approximately $0.5°$, estimate the diameter of the sun to the nearest 10,000 miles.

a. 820,000 miles
b. 790,000 miles
c. 840,000 miles
d. 850,000 miles
e. 810,000 miles

____ 17. The figure is a model of George Ferris's Ferris wheel. The diameter of the wheel is 250 feet; and θ is the central angle formed as a rider travels from his or her initial position P_0 to position P_1. Find the distance traveled by the rider if $\theta = 210°$.



a. 455.1 ft
b. 457.1 ft
c. 454.1 ft
d. 460.1 ft
e. 458.1 ft

____ 18. θ is a central angle that cuts off an arc of length *s*. Find the radius of the circle if $\theta = \frac{\pi}{7}$, $s = \pi$cm.

a. 6 cm
b. 7.87 cm
c. 10 cm
d. 9 cm
e. 7 cm

____ 19. Find the area of the sector formed by central angle $\theta = \frac{\pi}{5}$ in a circle of radius $r = 5$ m.

a. 7.87 m^2
b. 7.79 m^2
c. 7.85 m^2
d. 7.77 m^2
e. 7.89 m^2

____ 20. An arc of length 2 feet is cut off by a central angle of $\frac{\pi}{6}$ radians. Find the area of the sector formed.

a. 3.82 ft^2
b. 3.84 ft^2
c. 3.86 ft^2
d. 3.88 ft^2
e. 3.74 ft^2

____ 21. Find the linear velocity of a point moving with uniform circular motion, if the point covers a distance s in an amount of time t, where $s = 22$ mi and $t = 2$ hr.

a. 10.7 mph
b. 8 mph
c. 10 mph
d. 11 mph
e. 9 mph

____ 22. Point P sweeps out central angle θ as it rotates on a circle of radius r. Find the angular velocity of point P.

$\theta = \frac{2\pi}{5}, t = 5$ sec

a. 0.234 rad/sec
b. 0.277 rad/sec
c. 0.208 rad/sec
d. 0.329 rad/sec
e. 0.251 rad/sec

____ 23. Point P sweeps out central angle θ as it rotates on a circle of radius r. Find the angular velocity of point P.

$\theta = 30, t = 6$ min

a. 6 rad/min
b. 6.53 rad/min
c. 5 rad/min
d. 3 rad/min
e. 4.43 rad/min

____ 24. Point P moves with angular velocity ω on a circle of radius r. Find the distance s traveled by the point in time t.

$\omega = \frac{3\pi}{4}$ rad/sec, $r = 4$ m, $t = 25$ sec

a. 653 m
b. 219 m
c. 511 m
d. 236 m
e. 538 m

____ 25. Find the angular velocity associated with the given rpm.

9.1 rpm

a. 66.6 rad/min
b. 45 rad/min
c. 63 rad/min
d. 60.3 rad/min
e. 57.2 rad/min

Answer Section

MULTIPLE CHOICE

1. C
2. D
3. C
4. C
5. C
6. D
7. B
8. D
9. B
10. E
11. C
12. A
13. E
14. D
15. E
16. E
17. E
18. E
19. C
20. A
21. D
22. E
23. C
24. D
25. E