CHAPTER 3, FORM E
TRIGONOMETRY

NAME_____
DATE _____

Choose the best answer.

Do not use a calculator for problems 1-11.

1. Which of the following describes the measures of all angles that are coterminal with the angle whose measure is $\pi/8$ radian? (Assume n is any integer.) **1.** _____

a. $\frac{n\pi}{4}$ **b.** $\frac{\pi}{8}+2n$

c. $\frac{\pi}{8}+2n\pi$ **d.** None of these

Convert each of the following degree measures to radians. Leave answers as multiples of π.

2. 225° **2.** _____

a. $\frac{5\pi}{4}$ **b.** $\frac{5\pi}{2}$

c. $\frac{9\pi}{4}$ **d.** None of these

3. 420° **3.** _____

a. 2π **b.** $\frac{5\pi}{3}$

c. $\frac{7\pi}{6}$ **d.** None of these

4. 195° **4.** _____

a. $\frac{\pi}{12}$ **b.** $\frac{9\pi}{8}$

c. $\frac{13\pi}{12}$ **d.** None of these

Convert each of the following radian measures to degrees.

5. $\frac{5\pi}{4}$ **5.** _____

a. 135° **b.** 225°
c. 165° **d.** None of these

6. $\frac{5\pi}{6}$ **6.** _____

a. 150° **b.** 120°
c. 165° **d.** None of these

7. $\frac{17\pi}{12}$ **7.** _____

a. 245° **b.** 185°
c. 290° **d.** None of these

Evaluate each of the following. Give exact values.

8. $\cos\frac{5\pi}{3}$ **8.** _____

a. $\frac{5}{3}$ **b.** $\frac{1}{2}$

c. $-\frac{1}{2}$ **d.** $-\frac{\sqrt{3}}{2}$

9. $\tan\frac{9\pi}{4}$ **9.** _____

a. 1 **b.** $-\frac{\sqrt{2}}{2}$

c. $\sqrt{2}$ **d.** $\frac{\sqrt{2}}{2}$

10. $\csc\frac{2\pi}{3}$ **10.** _____

a. –2 **b.** $\frac{2\sqrt{3}}{3}$

c. $2\sqrt{3}$ **d.** 0

11. Give the exact value of t in the interval $\left(\frac{\pi}{2}, \pi\right]$ **11.** _____

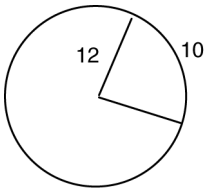
such that $\tan t = -1$.

a. $\frac{7\pi}{8}$ **b.** $\frac{11\pi}{12}$

c. $\frac{5\pi}{8}$ **d.** $\frac{3\pi}{4}$

Use a calculator as necessary in Problems 12-20.

12. Find the measure, to the nearest degree, of the acute central angle in the figure below. **12.** _____



a. 22° **b.** 41°
c. 48° **d.** 77°

13. What would be the measure of the acute central angle in the figure above if the radius were doubled (and the arc length remained unchanged)? **13.** _____

a. 12° **b.** 24°
c. 48° **d.** 52°

14. Find the area of a circle intercepted by a central angle of 210° in a circle of radius 3.1 cm. **14.** _____

a. 17.6 cm^2 **b.** 32.5 cm^2
c. 20.8 cm^2 **d.** 41.1 cm^2

Use a calculator to find the following.

15. sin 4.2143 **15.** _____

a. –.8785 **b.** –.4777
c. .3672 **d.** 1.8388

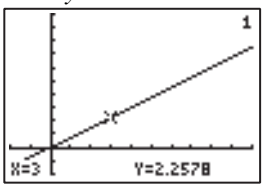
16. cot 5.2398 **16.** _____

a. –1.7169 **b.** –1.1573
c. –.58244 **d.** 1.9869

17. Find the value of t in the interval $\left[\frac{3\pi}{2}, 2\pi\right]$ such that sec $t = 2.4183$. **17.** _____

a. 4.7231 **b.** 4.8329
c. 5.0328 **d.** 5.1387

18. Find the measure, in radians and degrees, of the angle α formed in the accompanying screen by the line passing through the origin and the positive x-axis. Use the displayed values of x and y at the bottom of the screen. **18.** _____



a. .3243 rad, 42.698° **b.** .6452 rad, 36.965°
c. .4652 rad, 18.483° **d.** None of these

19. Find the linear velocity of a point on the edge of a wheel rotating 48 times per min. The diameter of the wheel is 27 in. **19.** _____

a. 108 ft/min **b.** 221 ft/min
c. 339 ft/min **d.** 453 ft/min

20. A pulley has a radius of 4.3 cm. It takes 6 sec for 20 cm of belt to go around the pulley. Find the angular velocity of the pulley in radians per sec. **20.** _____

a. .5896 **b.** .7752
c. 1.2135 **d.** 1.4353

NAME _____
DATE _____

Choose the best answer.

Do not use a calculator for Problems 1-11.

1. Which of the following describes the measures of all angles that are coterminal with the angle whose measure is π/5 radian? (Assume n is any integer.) **1.** _____

a. $\frac{\pi}{5}+2n$ **b.** $\frac{\pi}{5}+2n\pi$

c. $\frac{n\pi}{5}$ **d.** None of these

Convert each of the following degree measures to radians. Leave answers as multiples of π.

2. 220° **2.** _____

a. $\frac{9\pi}{13}$ **b.** $\frac{23\pi}{12}$

c. $\frac{11\pi}{9}$ **d.** None of these

3. 345° **3.** _____

a. $\frac{7\pi}{4}$ **b.** $\frac{22\pi}{9}$

c. $\frac{9\pi}{5}$ **d.** None of these

4. 150° **4.** _____

a. $\frac{5\pi}{6}$ **b.** $\frac{7\pi}{6}$

c. $\frac{11\pi}{12}$ **d.** None of these

Convert each of the following radian measures to degrees.

5. $-\frac{11\pi}{9}$ **5.** _____

a. 135° **b.** 220°
c. 300° **d.** None of these

6. $\frac{17\pi}{12}$ **6.** _____

a. 220° **b.** 255°
c. 310° **d.** None of these

7. $\frac{5\pi}{6}$ **7.** _____

a. 120° **b.** 150°
c. 165° **d.** None of these

Evaluate each of the following. Give exact values.

8. $\sin\frac{4\pi}{3}$ **8.** _____

a. $-\frac{\sqrt{3}}{2}$ **b.** $-\frac{1}{2}$
c. $\frac{1}{2}$ **d.** $\frac{2\sqrt{3}}{3}$

9. $\sec\frac{7\pi}{4}$ **9.** _____

a. $-\sqrt{2}$ **b.** 0
c. $\sqrt{2}$ **d.** undefined

10. $\cot\frac{5\pi}{6}$ **10.** _____

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

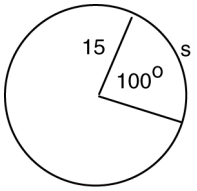
11. Give the exact value of w in the interval $\left[0, \frac{\pi}{2}\right]$ **11.** _____

such that $\sec w = \sqrt{2}$.

a. $\frac{5\pi}{12}$ **b.** $\frac{3\pi}{8}$
c. $\frac{5\pi}{8}$ **d.** $\frac{\pi}{4}$

Use a calculator as necessary in Problems 12-20.

12. Find the length s in the figure below. **12.** _____



a. 11 **b.** 19
c. 26 **d.** 35

13. What would be the radius of the circle in the figure above if the arc length doubled (and the central angle remained unchanged)? **13.** _____

a. 12 **b.** 15
c. 18 **d.** 30

14. Find the area of a sector of a circle intercepted by a central angle of 245° in a circle of radius 9.8 in. **14.** _____

a. 178.6 in.^2 **b.** 205.3 in.^2
c. 213.4 in.^2 **d.** 332.4 in.^2

Use a calculator to find the following.

15. sin .1298 **15.** _____

a. –1.1345 **b.** –.2467
c. .1294 **d.** 1.6554

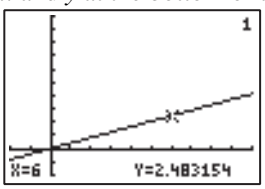
16. csc 2.7839 **16.** _____

a. –1.0676 **b.** –.3738
c. .3501 **d.** 2.8562

17. Find the value of w in the interval $\left[\pi, \frac{3\pi}{2}\right]$ such that cot $w = 6.7542$. **17.** _____

a. 3.2439 **b.** 3.2886
c. 4.2938 **d.** 5.6248

18. Find the measure, in radians and degrees, of the angle β formed in the accompanying screen by the line passing through the origin and the positive x-axis. Use the displayed values of x and y at the bottom of the screen. **18.** _____



a. .3924 rad, 22.483° **b.** .4267 rad, 24.447°
c. 1.1441 rad, 65.553° **d.** None of these

19. Find the linear velocity of a point on the edge of a wheel rotating 35 times per min. The diameter of the wheel is 38 cm. **19.** _____

a. 22 cm/sec **b.** 29 cm/sec
c. 31 cm/sec **d.** 70 cm/sec

20. Two pulleys of radius 6 cm and 10 cm, respectively, are connected by a belt. The larger pulley rotates at 40 times per min. Find the angular velocity of each pulley in radians per minute. **20.** _____

a. 219; 219 **b.** 419; 251
c. 397; 238 **d.** 438; 219