

MATH 244/GRACEY  
5.1 PRACTICE

Name \_\_\_\_\_

**Solve the problem.**

- 1) Find the complement of an angle whose measure is  $8^\circ$ .

6)  $90^\circ - 5^\circ 14'$

- 2) Find the supplement of an angle whose measure is  $36^\circ$ .

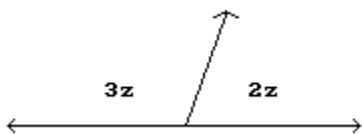
7)  $71^\circ 21' - 11^\circ 46'$

**Convert the angle to decimal degrees and round to the nearest hundredth of a degree.**

8)  $56^\circ 54' 8''$

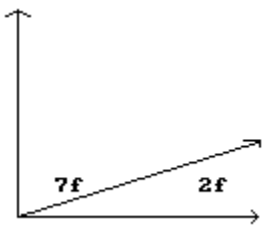
**Find the measure of each angle in the problem.**

3)



9)  $31^\circ 8' 17''$

4)



10)  $78^\circ 8'$

**Convert the angle to degrees, minutes, and seconds.**

11)  $79.02^\circ$

**Perform the calculation.**

5)  $124^\circ 37' + 340^\circ 34'$

12)  $59.18^\circ$

13)  $209.64^\circ$

20)  $-60^\circ$

**Find the angle of smallest possible positive measure coterminal with the given angle.**

21)  $-530^\circ$

14)  $-197^\circ$

22)  $810^\circ$

15)  $871^\circ$

**Solve the problem.**

16)  $-31^\circ$

23) Through how many radians will the hour hand on a clock rotate in 48 hours?

17)  $1318^\circ$

24) A circular pulley is rotating about its center. Through how many radians would it turn in 8 rotations?

**Give an expression that generates all angles coterminal with the given angle. Let  $n$  represent any integer.**

18)  $142^\circ$

**Convert the radian measure to degrees. Round to the nearest hundredth if necessary.**

25)  $\frac{\pi}{4}$

**Convert the angle to radians. Leave your answer as a multiple of  $\pi$ .**

19)  $36^\circ$

26)  $\frac{9\pi}{2}$

Convert the radian measure to degrees. Give answer using decimal degrees to the nearest hundredth.

33) 2.8075

27)  $-\frac{\pi}{5}$

34) 5

28)  $-\frac{53}{18}\pi$

35) -5.5

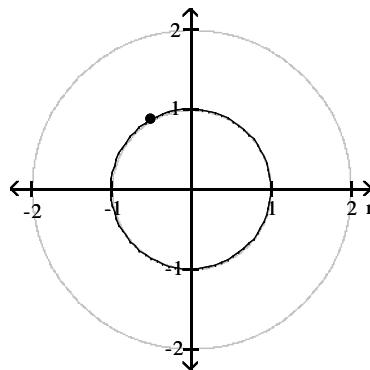
Convert the degree measure to radians, correct to four decimal places. Use 3.1416 for  $\pi$ .

29)  $251^\circ 7'$

Find the corresponding angle measure in radians.

36)  $120^\circ$

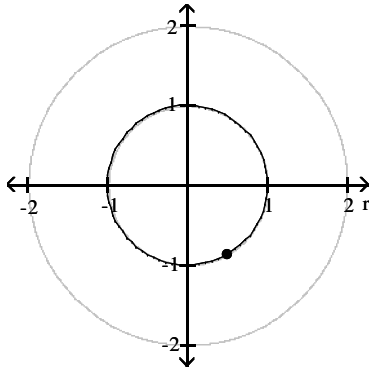
30)  $20^\circ$



31)  $27^\circ 43'$

32)  $33.4346^\circ$

37)  $-60^\circ$



Find the length of an arc intercepted by a central angle  $\theta$  in a circle of radius  $r$ . Round your answer to 1 decimal place.

42)  $r = 17.05$  ft;  $\theta = \frac{\pi}{35}$  radians

43)  $r = 16.46$  in.;  $\theta = 10^\circ$

**Provide an appropriate response.**

38) In your own words, explain what a radian is.

39) Explain the difference between an angle measuring 68 radians and one measuring  $68^\circ$ .

40) Describe how an angle measure can be converted from degrees to radians.

41) Describe how an angle measure can be converted from radians to degrees.

**Assume that the cities lie on the same north-south line and that the radius of the earth is 6400 km.**

44) Find the distance in kilometers between City A,  $16^\circ$  N, and City B,  $24^\circ$  N. (Round to the nearest whole number.)

45) Find the distance in kilometers between City E,  $32^\circ$  N, and City F,  $40^\circ$  S. (Round to the nearest whole number.)

46) Find the latitude of Winnipeg, Canada if Winnipeg and Austin, TX,  $30^\circ$  N, are 2234 km apart.

**Solve the problem.**

47) Electrical wire is being wound around a drum with radius of 0.50 meters. How much line would be wound around the drum if it is rotated through an angle of  $288.0^\circ$ ?

48) Find the radius of a pulley if rotating the pulley  $108.03^\circ$  raises the pulley 37.3 mm.

49) A tree 550 m away subtends an angle of  $2^\circ$ . Find the height of the tree.

**Find the area of a sector of a circle having the given radius  $r$  and central angle  $\theta$ . Use 3.14 for  $\pi$ .**

50)  $r = 40.6$  cm,  $\theta = \frac{\pi}{6}$  radians

51) Radius = 26.02 cm;  $\theta = 148^\circ$

**Solve the problem. Round answer to two decimal places.**

52) Find the radius of a circle in which a central angle of  $\frac{\pi}{4}$  radian determines a sector of area 86 square meters.

53) A pendulum swings through an angle of  $15^\circ$  each second. If the pendulum is 12 cm in length and the complete swing from right to left lasts 2 seconds, what area is covered by each complete swing?

54) What is the difference in area covered by a single 11-inch windshield wiper operating with a central angle of  $125^\circ$  compared to a pair of 9-inch wipers operating together each having a central angle of  $105^\circ$ ?

55) A sensor light installed on the edge of a home can detect motion for a distance of 63 ft. in front and with a range of motion of  $225^\circ$ . Over what area will the sensor detect motion and become illuminated?

Use the formula  $\omega = \frac{\theta}{t}$  to find the value of the missing variable.

56)  $\omega = \frac{\pi}{4}$  radians/min,  $t = 11$  min

57)  $\theta = \frac{\pi}{6}$  radians,  $t = 7$  sec

58)  $\omega = 7.2948$  radians/min,  $\theta = 14.28$  radians

**Solve the problem.**

65) Find  $\omega$  for the minute hand of a clock.

**Use the formula  $v = r\omega$  to find the value of the missing variable.**

59)  $r = 8$  cm,  $\omega = \frac{\pi}{11}$  radians/sec

66) Find  $\omega$  for a spoke on a bike tire revolving 81 times per minute.

60)  $v = 13$  ft/sec,  $r = 9.2$  ft

67) Find  $v$  for the tip of the hour hand of a clock, if the hand is 17 cm long.

61)  $v = 308.1$  m/sec,  $\omega = 0.13447$  radians/sec

68) A wheel is rotating at 7 radians/sec, and the wheel has a 69-inch diameter. To the nearest foot, what is the speed of a point on the rim in ft/min?

**Use the formula  $s = r\omega t$  to find the value of the missing variable.**

62)  $r = 2$  cm,  $\omega = \frac{\pi}{11}$  radians/sec,  $t = 32$  sec

69) A wheel with a 14-inch diameter is turning at the rate of 31 revolutions per minute. To the nearest inch, what is the speed of a point on the rim in in./min?

63)  $s = \frac{\pi}{7}$  m,  $r = 5$  m,  $t = 4$  sec

70) Two pulleys of diameter 6 m and 3 m are connected by a belt. The larger pulley rotates 41 times per min. Find the angular speed of the smaller pulley.

64)  $s = 3.4$  m,  $r = 9.177$  m,  $\omega = 0.5602$  radians/sec

71) A pulley of radius 11 cm rotates 19 times in 64 sec. Find the angular speed of the pulley.

72) The radius of the tires of a car is 24 inches, and they are revolving at the rate of 568 revolutions per minute. How fast is the car traveling in miles per hour?

# Answer Key

## Testname: 5.1PRAC

- 1)  $82^\circ$
- 2)  $144^\circ$
- 3)  $108^\circ$  and  $72^\circ$
- 4)  $70^\circ$  and  $20^\circ$
- 5)  $465^\circ 11'$
- 6)  $84^\circ 46'$
- 7)  $59^\circ 35'$
- 8)  $56.90^\circ$
- 9)  $31.14^\circ$
- 10)  $78.13^\circ$
- 11)  $79^\circ 1' 12''$
- 12)  $59^\circ 10' 48''$
- 13)  $209^\circ 38' 24''$
- 14)  $163^\circ$
- 15)  $151^\circ$
- 16)  $329^\circ$
- 17)  $238^\circ$
- 18)  $142^\circ + n \cdot 360^\circ$
- 19)  $\frac{\pi}{5}$
- 20)  $-\frac{\pi}{3}$
- 21)  $-\frac{53\pi}{18}$
- 22)  $\frac{9\pi}{2}$
- 23)  $8\pi$
- 24)  $16\pi$
- 25)  $45^\circ$
- 26)  $810^\circ$
- 27)  $-36^\circ$
- 28)  $-530^\circ$
- 29) 4.3828
- 30) 0.3491
- 31) 0.4837
- 32) 0.5835
- 33)  $160.86^\circ$
- 34)  $286.48^\circ$
- 35)  $-315.13^\circ$
- 36)  $\frac{\pi}{3}$
- 37)  $\frac{5\pi}{3}$
- 38) Answers will vary
- 39) Answers will vary
- 40) Multiply the degree measure by  $\frac{\pi}{180^\circ}$ .
- 41) Multiply the degree measure by  $\frac{180^\circ}{\pi}$ .
- 42) 1.5 ft
- 43) 2.9 in.
- 44) 894 km
- 45) 8042 km
- 46)  $50^\circ \text{N}$
- 47) 2.51 m
- 48) 19.78 mm
- 49) 19 m
- 50)  $431.5 \text{ cm}^2$
- 51)  $873.98 \text{ cm}^2$
- 52) 14.80 m
- 53)  $37.71 \text{ cm}^2$
- 54)  $16.46 \text{ in.}^2$
- 55)  $7793.11 \text{ ft}^2$
- 56)  $\theta = \frac{11\pi}{4}$  radians
- 57)  $\theta = \frac{\pi}{42}$  radians/sec
- 58) 1.958 min
- 59)  $v = \frac{8\pi}{11}$  cm/sec
- 60) 1.4 radians/sec
- 61) 2291.2 m
- 62)  $s = \frac{64\pi}{11}$  cm
- 63)  $\omega = \frac{\pi}{140}$  radians/sec
- 64)  $t = 0.6614$  sec
- 65)  $\frac{\pi}{30}$  radians per minute
- 66)  $162\pi$  radians per min
- 67)  $\frac{17\pi}{6}$  cm per hour
- 68) 1208 ft/min
- 69) 1363 in./min
- 70)  $164\pi$  radians/min
- 71)  $\frac{209\pi}{32}$  radians/sec
- 72)  $\frac{284}{11}\pi$  mph