

Convert the degree measure to radians. Leave answer as a multiple of π .

$$1) 30^\circ = 30 \left(\frac{\pi}{180} \right) = \boxed{\frac{\pi}{6}}$$

$$2) -45^\circ = -45 \left(\frac{\pi}{180} \right) = \boxed{-\frac{\pi}{4}}$$

$$3) 330^\circ = 330 \left(\frac{\pi}{180} \right) = \boxed{\frac{11\pi}{6}}$$

$$4) 288^\circ = 288 \left(\frac{\pi}{180} \right) = \boxed{\frac{8\pi}{5}}$$

$$5) -450^\circ$$

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

$$6) \frac{\pi}{4} = \frac{\pi}{4} \left(\frac{180}{\pi} \right) = \boxed{45^\circ}$$

$$7) \frac{10\pi}{3} = \frac{10\pi}{3} \left(\frac{180}{\pi} \right) = \boxed{600^\circ}$$

$$8) 2\pi$$

$$9) -15\pi = -15\pi \left(\frac{180}{\pi} \right) = \boxed{-2700^\circ}$$

Convert the degree measure to radians, correct to four decimal places. Use 3.1416 for π .

$$10) 350^{\circ}46' \doteq 350.7667 \left(\frac{\pi}{180} \right) \approx \boxed{6.1220}$$

$$11) 81^{\circ}$$

$$12) 21.8431^{\circ} \approx 21.8431 \left(\frac{\pi}{180} \right) \approx \boxed{0.3812}$$

Convert the radian measure to degrees. Give answer using decimal degrees to the nearest hundredth. Use 3.1416 for π .


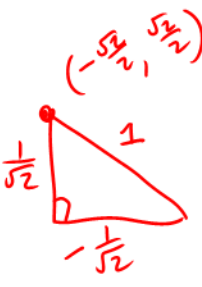
$$13) 0.2521$$

$$14) 1 = 1 \left(\frac{180^{\circ}}{\pi} \right) \approx 57.30^{\circ}$$

Find the exact value without using a calculator.

$$15) \cos\left(\frac{2\pi}{3}\right) = \cos 120^{\circ} = -\cos 60^{\circ} = \boxed{-\frac{1}{2}}$$

$$16) \sin\frac{3\pi}{4} = \sin\frac{\pi}{4} = \boxed{\frac{\sqrt{2}}{2}}$$

QII  

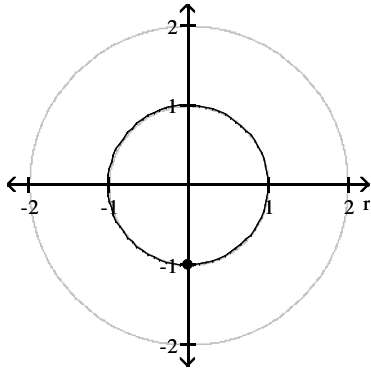
$$17) \tan\frac{-5\pi}{6}$$

$$18) \csc\frac{4\pi}{3}$$

$$19) \cot\pi$$

Find the corresponding angle measure in radians.

20) 270°



Solve the problem.

21) Through how many radians will the hour hand on a clock rotate in 36 hours?



$$36 \text{ hrs} = 3 \text{ revolutions}$$

$$1 \text{ rev} = 2\pi \text{ radians}$$

$$3 \text{ revs} \times \frac{2\pi \text{ rad.}}{1 \text{ rev}} = \boxed{6\pi}$$

22) A circular pulley is rotating about its center. Through how many radians would it turn in 11 rotations?

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

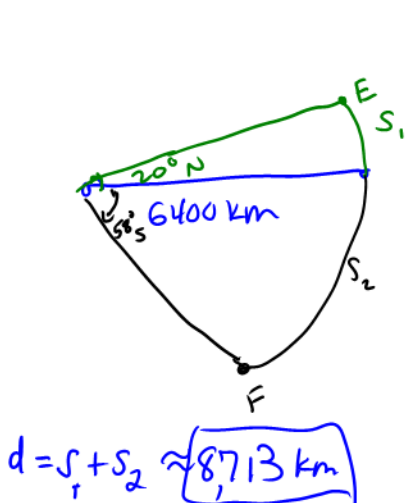
23) $r = 38.81 \text{ ft}$; $\theta = \frac{\pi}{3}$ radians

$$s = r\theta$$

$$s = (38.81) \left(\frac{\pi}{3} \right) \approx \boxed{40.6 \text{ ft}}$$

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

24) Find the distance between City E, 20° N and City F, 58° S . (Round to the nearest kilometer.)



$$s_1 = \frac{(6400)}{r} \left(20^\circ \right) \left(\frac{\pi}{180} \right)$$

θ_1 in radians

$$s_1 \approx 2234 \text{ km}$$

$$s_2 = (6400) (58^\circ) \left(\frac{\pi}{180} \right)$$

$$s_2 \approx 6479 \text{ km}$$

$$d = s_1 + s_2 \approx \boxed{8713 \text{ km}}$$

Solve the problem.

25) A pendulum of length 19.1 inches swings $4^{\circ}23'$ to each side of its vertical position. To the nearest hundredth of an inch, what is the length of the arc through which the end of the pendulum swings?

26) A bicycle with a 24-inch wheel (diameter) travels a distance of 1000 feet. How many revolutions does the wheel make (to the nearest revolution)?

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

27) Find the distance between City A, 60° N and City B, 35° N. (Round to the nearest kilometer.)

Solve the problem.

28) A car wheel has a 16-inch radius. Through what angle (to the nearest tenth of a degree) does the wheel turn when the car rolls forward 2 ft?

29) A pulley rotates through 82° in one minute. How many rotations does the pulley make in an hour?

Approximate the length by finding the necessary arc length.

30) A tree 550 m away subtends an angle of 2° . Find the height of the tree.

Find the area of a sector of a circle having radius r and central angle θ . Express the answer to the nearest tenth.

31) $r = 67.4$ cm, $\theta = \frac{\pi}{7}$ radians

32) $r = 20.0$ m, $\theta = 20^\circ$

Solve the problem. Round answer to 2 decimal places.

33) Find the measure (in radians) of a central angle of a sector of area 52 square inches in a circle of radius 6 inches.

34) A pendulum swings through an angle of 9° each second. If the pendulum is 14 cm in length and the complete swing from right to left lasts 4 seconds, what area is covered by each complete swing?

35) A sensor light installed on the edge of a home can detect motion for a distance of 51 ft. in front and with a range of motion of 204° . Over what area will the sensor detect motion and become illuminated?

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

36) $r = 31.31$ in.; $\theta = 92^\circ$

Answer Key

Testname: WS3.1-3.2

1) $\frac{\pi}{6}$

2) $-\frac{\pi}{4}$

3) $\frac{11\pi}{6}$

4) $\frac{8\pi}{5}$

5) $-\frac{5\pi}{2}$

6) 45°

7) 600°

8) 360°

9) -2700°

10) 6.122

11) 1.4137

12) 0.3812

13) 14.44°

14) 57.30°

15) $-\frac{1}{2}$

16) $\frac{\sqrt{2}}{2}$

17) $\frac{\sqrt{3}}{3}$

18) $-\frac{2\sqrt{3}}{3}$

19) undefined

20) $\frac{3\pi}{2}$

21) 6π

22) 22π

23) 40.6 ft

24) 8713 km

25) 2.92 in.

26) 159 revolutions

27) 2793 km

28) 85.9°

29) 13.7 rotations

30) 19 m

31) 1019.4 cm^2

32) 69.8 m^2

33) 2.89 radians

34) 61.58 cm^2

35) 4630.39 ft^2

36) 50.3 in.