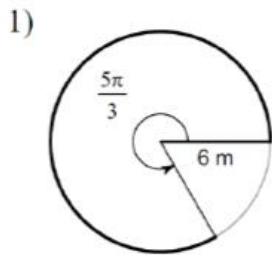
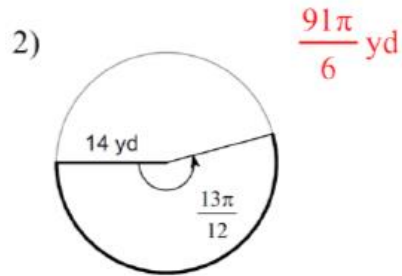


Unit 2.3 Application of Radian Measure PRACTICE

Find the length of each arc.

 10π m $\frac{91\pi}{6}$ yd

3) $r = 14$ cm, $\theta = \frac{5\pi}{6}$ $\frac{35\pi}{3}$ cm

4) $r = 10$ yd, $\theta = \frac{5\pi}{4}$ $\frac{25\pi}{2}$ yd

5) $r = 12$ m, $\theta = \frac{7\pi}{6}$

6) $r = 10$ in, $\theta = \frac{7\pi}{6}$ $\frac{35\pi}{3}$ in

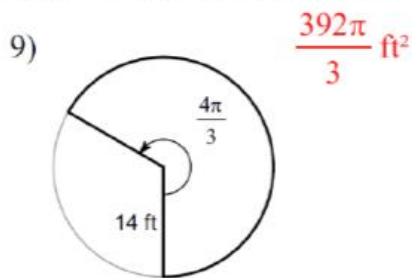
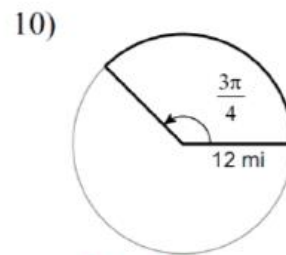
 14π m

7) $r = 15$ km, $\theta = \frac{\pi}{3}$

8) $r = 10$ yd, $\theta = \frac{5\pi}{3}$ $\frac{50\pi}{3}$ yd

 5π km

Find the area of each sector.

 $\frac{392\pi}{3}$ ft² 54π mi²

11) $r = 6$ yd, $\theta = \frac{3\pi}{4}$ $\frac{27\pi}{2}$ yd²

12) $r = 8$ ft, $\theta = \frac{\pi}{2}$

 16π ft²

13) $r = 13$ yd, $\theta = \frac{5\pi}{12}$ $\frac{845\pi}{24}$ yd²

14) $r = 13$ in, $\theta = \frac{2\pi}{3}$ $\frac{169\pi}{3}$ in²

15) $r = 19$ yd, $\theta = \frac{7\pi}{4}$ $\frac{2527\pi}{8}$ yd²

16) $r = 3$ cm, $\theta = \frac{7\pi}{4}$ $\frac{63\pi}{8}$ cm²

For #17 and #18 use Earth's radius is 6400 km.

KEY

17. **Latitude of Madison** Madison, South Dakota, and Dallas, Texas, are 1200 km apart and lie on the same north-south line. The latitude of Dallas is 33° N. What is the latitude of Madison?

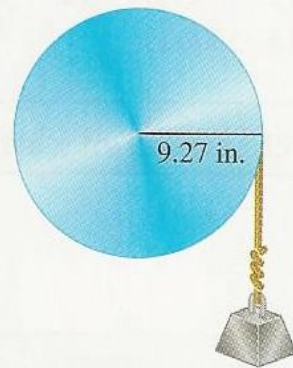
44° N (exact is $43^\circ 44' 35''$)

18. **Latitude of Toronto** Charleston, South Carolina, and Toronto, Canada, are 1100 km apart and lie on the same north-south line. The latitude of Charleston is 33° N. What is the latitude of Toronto?

43° N (exact is $42^\circ 50' 52''$)

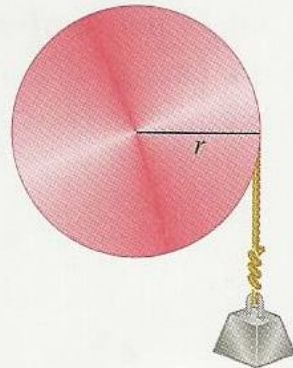
19. **Pulley Raising a Weight**

- (a) How many inches will the weight in the figure rise if the pulley is rotated through an angle of $71^\circ 50'$?
- (b) Through what angle, to the nearest minute, must the pulley be rotated to raise the weight 6 in.?



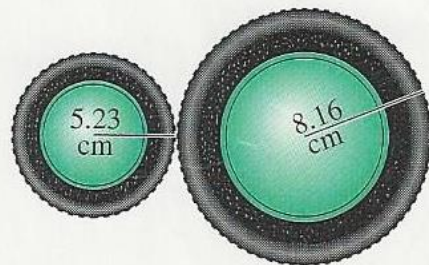
a) 11.6 in. b) $37^\circ 5'$

20. **Pulley Raising a Weight** Find the radius of the pulley in the figure if a rotation of 51.6° raises the weight 11.4 cm.



12.7 cm

21. **Rotating Wheels** The rotation of the smaller wheel in the figure causes the larger wheel to rotate. Through how many degrees will the larger wheel rotate if the smaller one rotates through 60.0° ?



38.5°