Secondary 3   Name <u>Key .</u>   Period _____

9.3 HW: Radians

Convert each degree measure into radians. Leave your answer as a reduced fraction with π (NO FRACTIONS!)

1. $-195°$

$$-\frac{13\pi}{12}$$

2. $275°$

$$\frac{55\pi}{36}$$

3. $220°$

$$\frac{11\pi}{9}$$

4. $-250°$

$$-\frac{25\pi}{18}$$

Convert each radian measure into degrees.

5. $-\frac{29\pi}{36}$

$$-145°$$

6. $-\frac{7\pi}{12}$

$$-105°$$

7. $\frac{\pi}{5}$

$$36°$$

8. $\frac{11\pi}{9}$

$$220°$$

Find the exact value of each trigonometric function.

9. $\cos \frac{3\pi}{2}$

0

10. $\tan -\frac{\pi}{4}$

-1

11. $\cos \frac{4\pi}{3}$

$-\frac{1}{2}$

12. $\tan \frac{\pi}{4}$

1

13. $\sin -\pi$

0

14. $\cos -\frac{\pi}{3}$

$\frac{1}{2}$

15. $\cos 0$

1

16. $\cos \frac{3\pi}{4}$
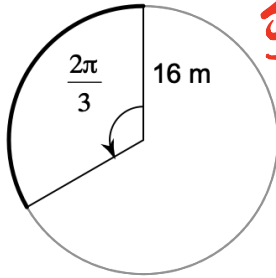
$-\frac{\sqrt{2}}{2}$

17. $\tan \frac{3\pi}{2}$

DNE

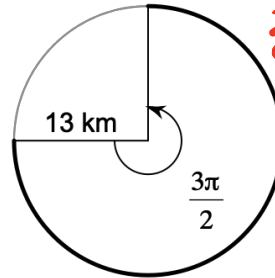18. $\tan \frac{\pi}{6}$

$\frac{\sqrt{3}}{3}$

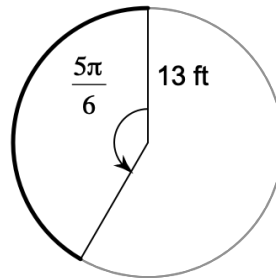**Find the length of each arc. Leave your answer as an exact value in terms of π and rounded to the nearest hundredth.**

19.

$\frac{32\pi}{3} = 33.51m$

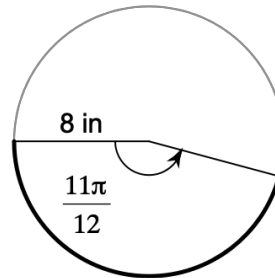Circle with radius 16 m, angle $\frac{2\pi}{3}$

20.

$\frac{39\pi}{2} = 61.26 \text{ Km}$

Circle with radius 13 km, angle $\frac{3\pi}{2}$

21.

$\frac{65\pi}{6} = 34.03 \text{ ft}$

Circle with radius 13 ft, angle $\frac{5\pi}{6}$

22.

$\frac{22\pi}{3} = 23.04 \text{ in}$

Circle with radius 8 in, angle $\frac{11\pi}{12}$

23. A geostationary satellite is positioned 35,000 km above Earth's surface. It takes 24 hours to complete one orbit. The radius of Earth is about 6,400 km.

   a. What distance does the satellite travel in 1 hr? 2.5 hr? 3 hr? 25 hr?

   1hr: 10,838.49 Km   3hr: 32,515.48 Km
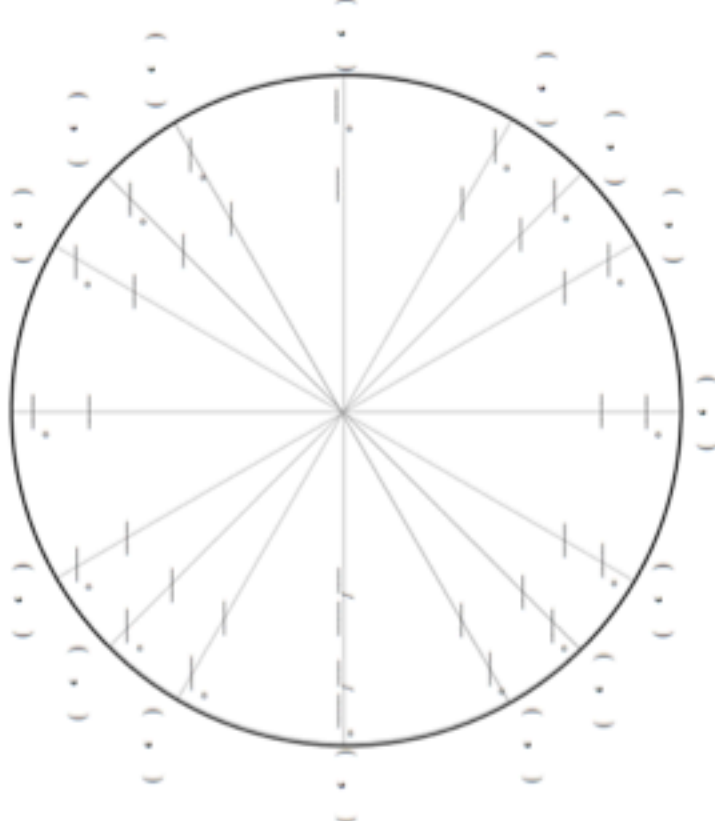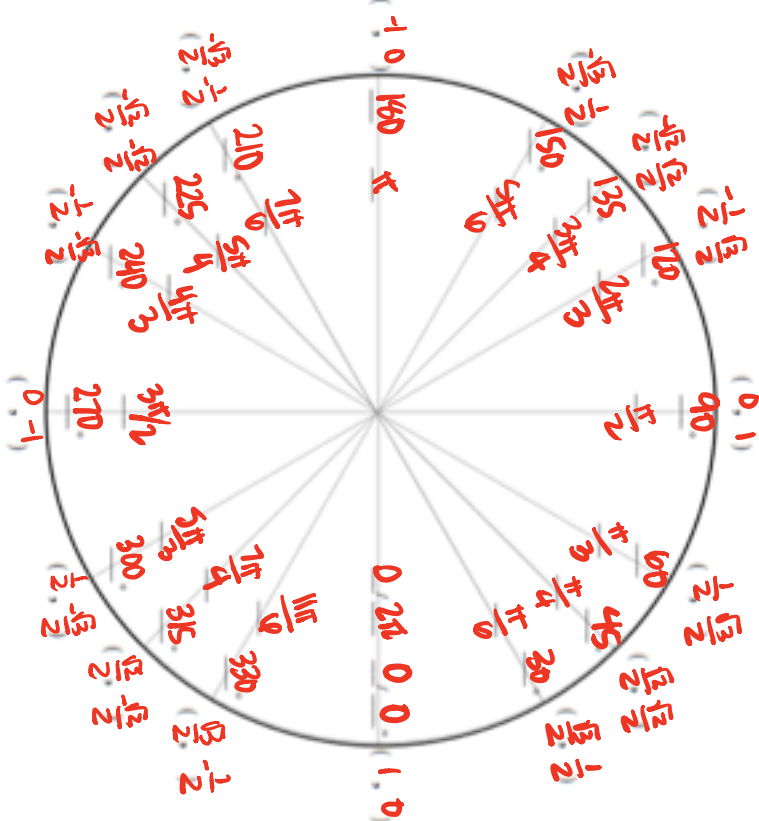
   2.5hr: 27,096.24 km   25hr: 270,962.37 Km

   b. How long does it take the satellite to travel 200,000 km?

   18.45 hr
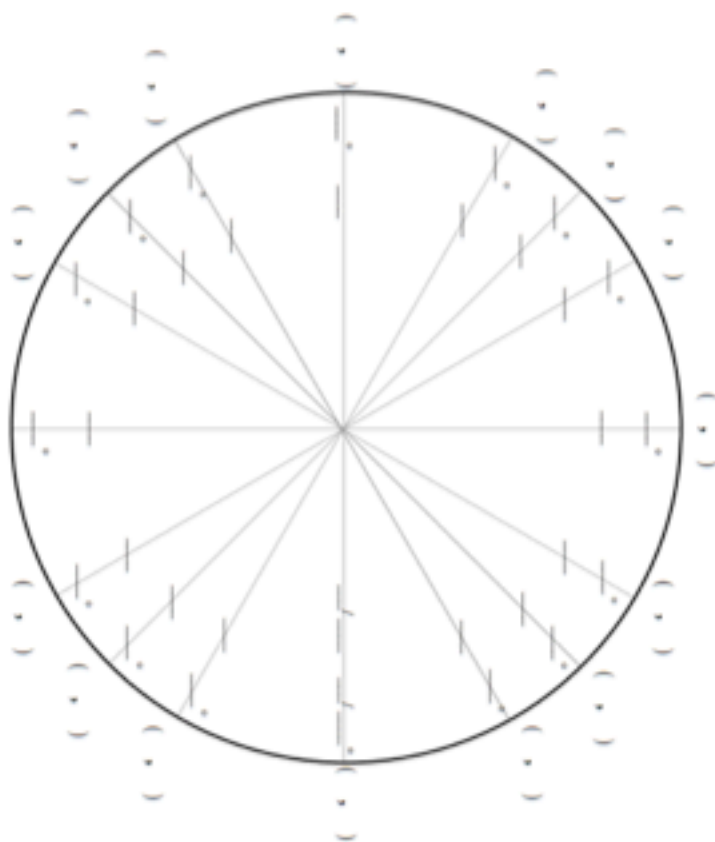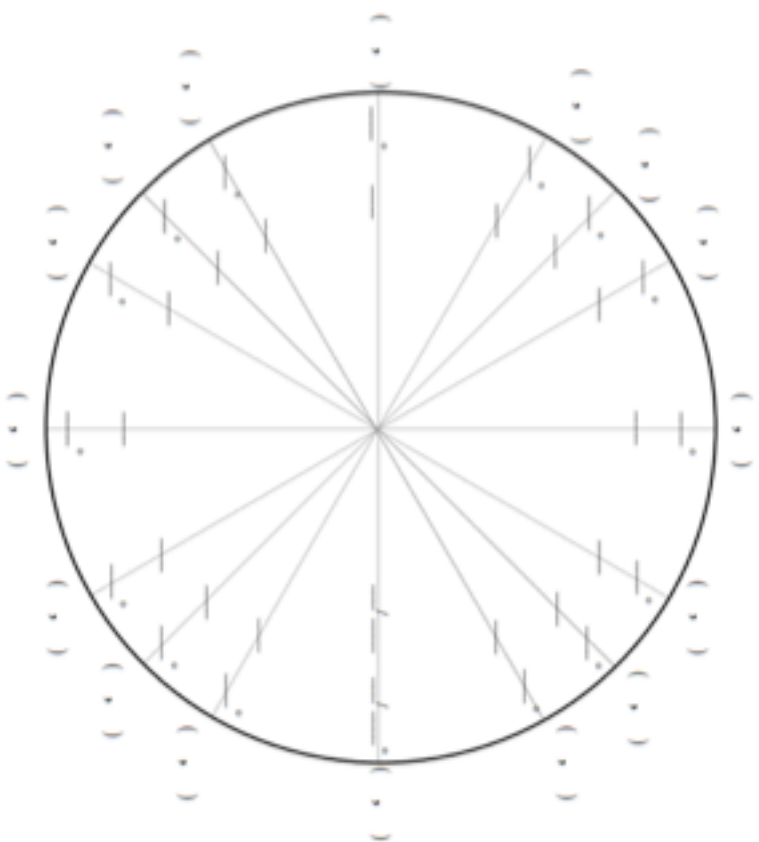
24. Suppose a windshield wiper has a length of 22 in. and rotates through an angle of 110°. What distance does the tip of the wiper travel as it moves across the windshield?

   42.24 in

Circle 1 (filled in red):

- $\frac{-1}{2}, 0$ — $180°$ — π
- $\frac{-\sqrt{3}}{2}, \frac{1}{2}$ — 210 — $\frac{7\pi}{6}$
- $\frac{-\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}$ — 225 — $\frac{5\pi}{4}$
- $\frac{-1}{2}, \frac{-\sqrt{3}}{2}$ — 240 — $\frac{4\pi}{3}$
- $0, -1$ — 270 — $\frac{3\pi}{2}$
- $\frac{-1}{2}, \frac{-\sqrt{3}}{2}$ — 300 — $\frac{5\pi}{3}$
- $\frac{-\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}$ — 315 — $\frac{7\pi}{4}$
- $\frac{-\sqrt{3}}{2}, \frac{-1}{2}$ — 330 — $\frac{11\pi}{6}$
- $0, -1$ — $0, 2\pi$
- $\frac{\sqrt{3}}{2}, \frac{-1}{2}$ — $\frac{11\pi}{6}$
- $\frac{\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}$ — $\frac{7\pi}{4}$
- $\frac{1}{2}, \frac{-\sqrt{3}}{2}$ — 30 — 45 — 60
- $\frac{1}{2}, \frac{\sqrt{3}}{2}$ — $\frac{\pi}{3}$
- $1, 0$ — 90 — 0
- $0, 1$ — $\frac{\pi}{2}$
- $\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ — 120
- $\frac{\sqrt{3}}{2}, \frac{1}{2}$ — 135 — $\frac{3\pi}{4}$
- $\frac{1}{2}, \frac{\sqrt{3}}{2}$ — 150 — $\frac{5\pi}{6}$
- $\frac{2\pi}{3}$
- $\frac{-1}{2}, \frac{\sqrt{3}}{2}$
- $\frac{-\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$
- $\frac{-\sqrt{3}}{2}, \frac{1}{2}$