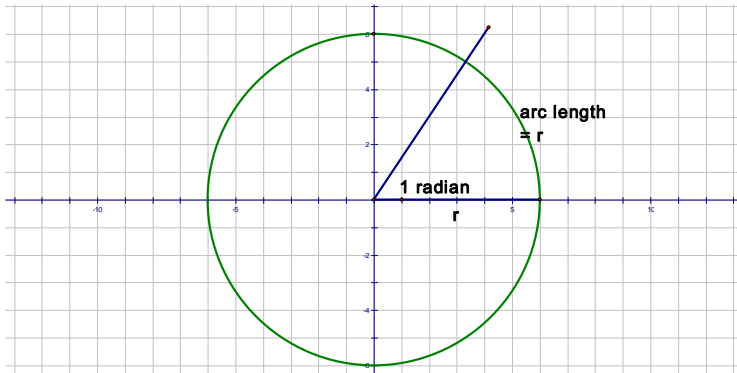


When a central angle intercepts an arc that has the same length as a radius of the circle, the measure of this angle is defined to be one **radian**.



The circumference of a circle is $2\pi r$, where r is the length of a radius. There are 2π radians in one complete revolution about a point and one complete revolution equals 360° .

$$2\pi \text{ radians} = 360^\circ \quad \pi \text{ radians} = 180^\circ \quad 1 \text{ radian} \approx 57.3^\circ$$

Convert each degree measure to radian measure.

a. 120°

b. -245°

Convert each radian measure to degree measure.

a. $\frac{\pi}{3}$ radians

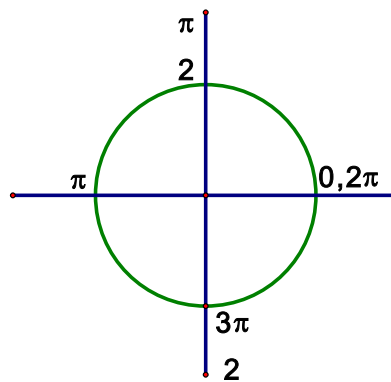
b. $-\frac{3\pi}{4}$ radians

Quadrant I if $0 < \theta < \frac{\pi}{2}$

Quadrant II if $\frac{\pi}{2} < \theta < \pi$

Quadrant III if $\pi < \theta < \frac{3\pi}{2}$

Quadrant IV if $\frac{3\pi}{2} < \theta < 2\pi$



In which quadrant or on which axis does the terminal side of the angle lie?

a. $\frac{4\pi}{3}$

b. $-\frac{5\pi}{4}$

c. $\frac{9\pi}{2}$

In which quadrant, or on which axis, does the terminal side of each angle lie? (Sketch each angle in standard position).

1. 150°

2. 210°

3. -60°

4. 180°

5. -240°

6. 540°

7. 2π

8. $\frac{\pi}{3}$

9. $\frac{3\pi}{4}$

10. $\frac{7\pi}{3}$

11. $\frac{5\pi}{4}$

12. $\frac{10\pi}{3}$

Convert each degree measure to radian measure.

13. 150°

14. 210°

15. 45°

16. 240°

Each radian measure to degree measure.

17. $\frac{\pi}{6}$

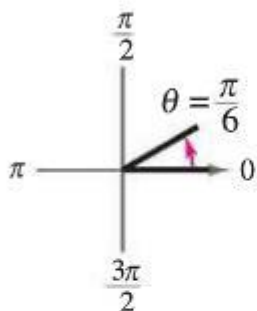
18. $\frac{\pi}{4}$

19. $\frac{5\pi}{6}$

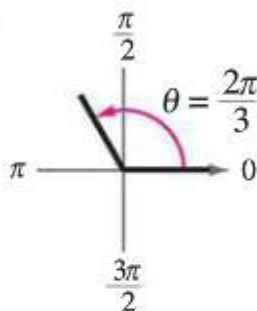
20. $\frac{7\pi}{6}$

Finding Coterminal Angles In Exercises 25–28, determine two coterminal angles in radian measure (one positive and one negative) for each angle. (There are many correct answers).

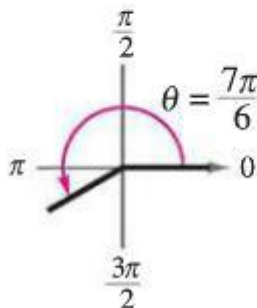
✓ 25. (a)



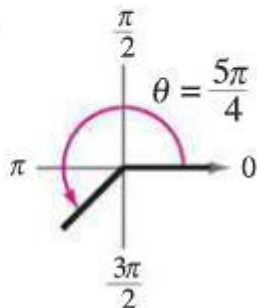
(b)



26. (a)



(b)



27. (a) $-\frac{9\pi}{4}$

(b) $-\frac{2\pi}{15}$