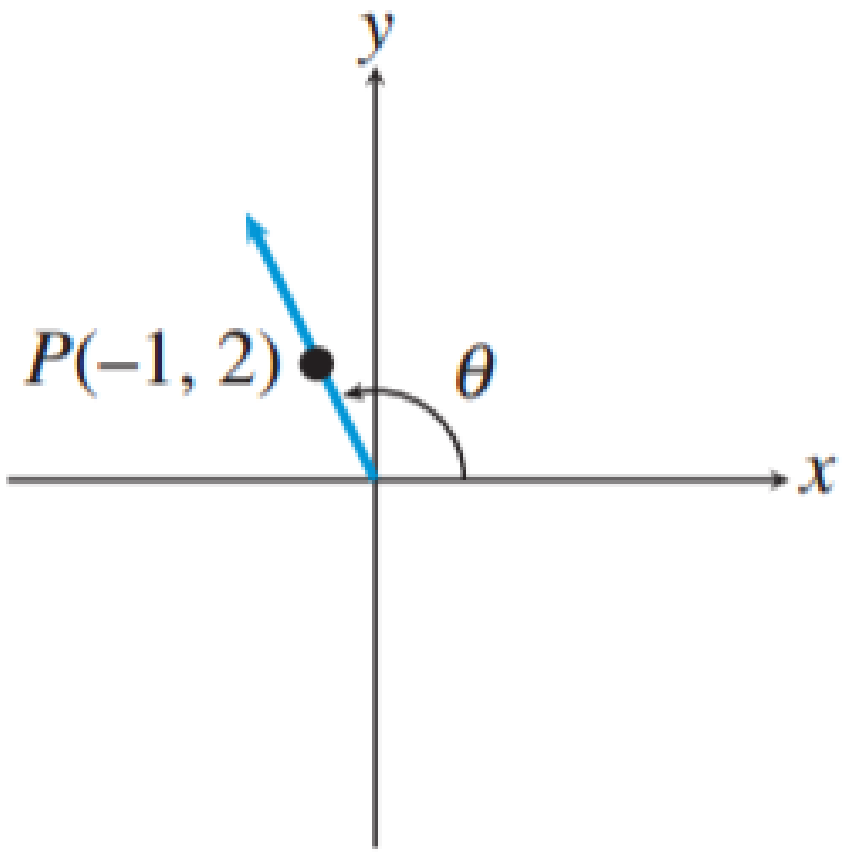
In Exercises 1 and 2, identify the one angle that is not coterminal with all the others.

1. $150°, 510°, -210°, 450°, 870°$

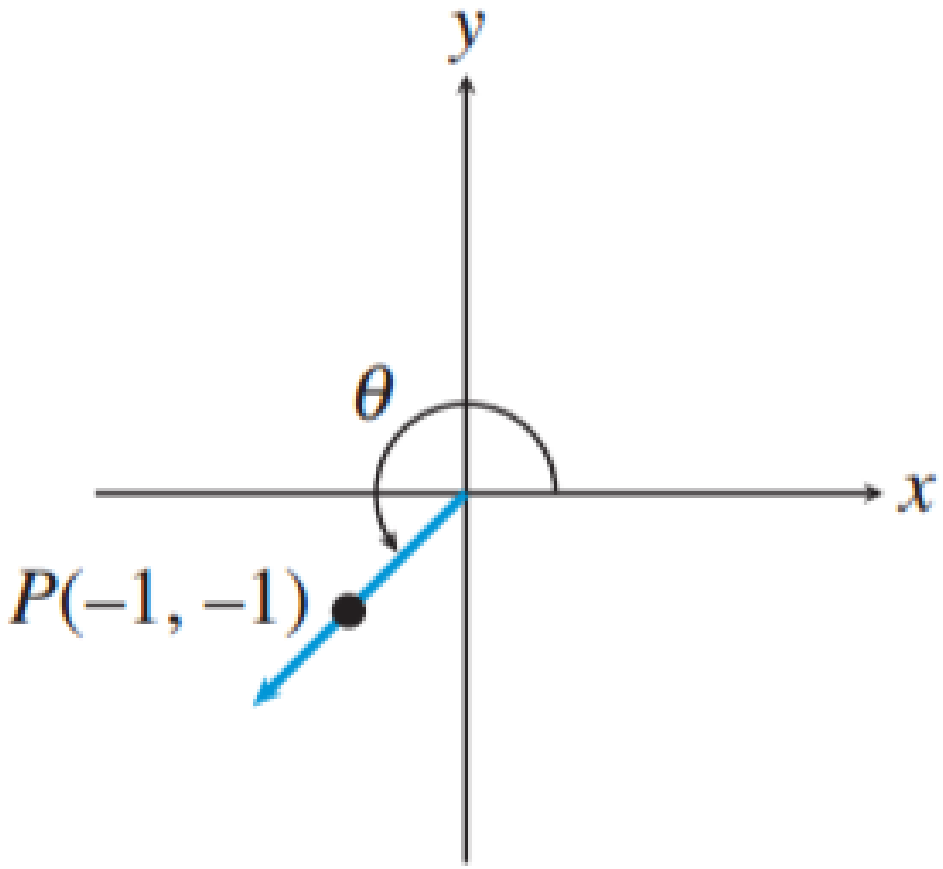
2. $\frac{5\pi}{3}, -\frac{5\pi}{3}, \frac{11\pi}{3}, -\frac{7\pi}{3}, \frac{365\pi}{3}$

In Exercises 3–6, evaluate the six trigonometric functions of the angle θ.

3.



5.



In Exercises 7–12, point P is on the terminal side of angle θ. Evaluate the six trigonometric functions for θ. If the function is undefined, write "undefined."

9. $P(0, 5)$

10. $P(-3, 0)$

11. $P(5, -2)$

12. $P(22, -22)$

In Exercises 13–16, state the sign (+ or −) of **(a)** $\sin t$, **(b)** $\cos t$, and **(c)** $\tan t$ for values of t in the interval given.

13. $\left(0, \frac{\pi}{2}\right)$

14. $\left(\frac{\pi}{2}, \pi\right)$

15. $\left(\pi, \frac{3\pi}{2}\right)$

16. $\left(\frac{3\pi}{2}, 2\pi\right)$

In Exercises 17–20, determine the sign (+ or −) of the given value without the use of a calculator.

17. $\cos 143°$

18. $\tan 192°$

19. $\cos \frac{7\pi}{8}$

20. $\tan \frac{4\pi}{5}$

In Exercises 21–24, choose the point on the terminal side of θ.

21. $\theta = 45°$

(a) $(2, 2)$ **(b)** $(1, \sqrt{3})$ **(c)** $(\sqrt{3}, 1)$

In Exercises 25–36, evaluate without using a calculator by using ratios in a reference triangle.

25. $\cos 120°$

26. $\tan 300°$

27. $\sec \frac{\pi}{3}$

28. $\csc \frac{3\pi}{4}$

29. $\sin \frac{13\pi}{6}$

30. $\cos \frac{7\pi}{3}$

31. $\tan -\frac{15\pi}{4}$

32. $\cot \frac{13\pi}{4}$

33. $\cos \frac{23\pi}{6}$

34. $\cos \frac{17\pi}{4}$

35. $\sin \frac{11\pi}{3}$

36. $\cot \frac{19\pi}{6}$

In Exercises 37–42, find **(a)** $\sin\theta$, **(b)** $\cos\theta$, and **(c)** $\tan\theta$ for the given quadrantal angle. If the value is undefined, write "undefined."

37. $-450°$

38. $-270°$

39. 7π

40. $\dfrac{11\pi}{2}$

41. $-\dfrac{7\pi}{2}$

42. -4π