EXAMPLE 2 on p. 867 for Exs. 12–15

QUADRANTAL ANGLES **Evaluate the six trigonometric functions of θ.**

12. $\theta = 0°$ **13.** $\theta = \frac{\pi}{2}$ **14.** $\theta = 540°$ **15.** $\theta = \frac{7\pi}{2}$

EXAMPLE 3 on p. 868 for Exs. 16–23

FINDING REFERENCE ANGLES **Sketch the angle. Then find its reference angle.**

16. $-100°$ **17.** $150°$ **18.** $320°$ **19.** $-370°$

20. $-\frac{5\pi}{6}$ **21.** $\frac{8\pi}{3}$ **22.** $\frac{15\pi}{4}$ **23.** $-\frac{13\pi}{6}$

EXAMPLE 4 on p. 869 for Exs. 24–31

EVALUATING FUNCTIONS **Evaluate the function without using a calculator.**

24. $\sec 135°$ **25.** $\tan 240°$ **26.** $\sin(-150°)$ **27.** $\csc(-420°)$

28. $\cos\frac{7\pi}{4}$ **29.** $\cot\left(-\frac{8\pi}{3}\right)$ **30.** $\tan\left(-\frac{3\pi}{4}\right)$ **31.** $\sec\frac{11\pi}{6}$

32. **ERROR ANALYSIS** Let (4, 3) be a point on the terminal side of an angle θ in standard position. *Describe* and correct the error in finding $\tan\theta$.

$$\tan\theta = \frac{x}{y} = \frac{4}{3}$$ ✗

33. **TAKS REASONING** Write $\tan\theta$ as the ratio of two other trigonometric functions. Use this ratio to explain why $\tan 90°$ is undefined but $\cot 90° = 0$.

34. **CHALLENGE** Five of the most famous numbers in mathematics — 0, 1, π, e, and i — are related by the simple equation $e^{\pi i} + 1 = 0$. Derive this equation using Euler's formula: $e^{a+bi} = e^a(\cos b + i\sin b)$.

PROBLEM SOLVING

EXAMPLE 5 on p. 869 for Exs. 35–36

In Exercises 35 and 36, use the formula in Example 5 on page 869.

35. **FOOTBALL** You and a friend each kick a football with an initial speed of 49 feet per second. Your kick is projected at an angle of 45° and your friend's kick is projected at an angle of 60°. About how much farther will your football travel than your friend's football?

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36. **IN-LINE SKATING** At what speed must the in-line skater launch himself off the ramp in order to land on the other side of the ramp?

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EXAMPLE 6 on p. 870 for Exs. 37–38

37. **TAKS REASONING** A Ferris wheel has a radius of 75 feet. You board a car at the bottom of the Ferris wheel, which is 10 feet above the ground, and rotate 255° counterclockwise before the ride temporarily stops. How high above the ground are you when the ride stops? If the radius of the Ferris wheel is doubled, is your height above the ground doubled? *Explain*.