EXAMPLES 5 and 6 on pp. 933–934 for Exs. 30–35

SOLVING **Solve the equation in the given interval. Check your solutions.**

30. $\sec x \csc^2 x = 2 \sec x;\ 0 \le x < 2\pi$

31. $\sqrt{3} \cos^2 x = \cos^2 x \tan x;\ 0 \le x \le \pi$

32. $2 \sin^2 x - \cos x - 1 = 0;\ 0 \le x < 2\pi$

33. $\sin^2 x + 5 \sin x - 3 = 0;\ -\frac{\pi}{2} \le x < \frac{\pi}{2}$

34. $\tan^2 x - 3 \tan x + 2 = 0;\ 0 \le x \le \pi$

35. $\cos x + \sin x \tan x = 2;\ \pi \le x < 2\pi$

36. **TAKS REASONING** What are the points of intersection of the graphs of $y = 4 \sin x + 1$ and $y = 2 \sin x + 2$ on the interval $0 \le x < 2\pi$?

(A) $\left(\frac{\pi}{6}, -3\right), \left(\frac{\pi}{2}, -3\right)$

(B) $\left(\frac{\pi}{6}, 3\right), \left(\frac{5\pi}{6}, 3\right)$

(C) $\left(\frac{\pi}{2}, 3\right), \left(\frac{7\pi}{6}, 3\right)$

(D) $\left(\frac{\pi}{6}, 3\right), \left(\frac{11\pi}{6}, 3\right)$

INTERSECTION POINTS **Find the points of intersection of the graphs of the given functions in the interval $0 \le x < 2\pi$.**

37. $y = \cos^2 x$
$y = 2 \cos x - 1$

38. $y = 9 \sin^2 x$
$y = \sin^2 x + 8 \sin x - 2$

39. $y = \sqrt{3} \tan^2 x$
$y = \sqrt{3} - 2 \tan x$

40. **CHALLENGE** A number c is a *fixed point* of a function f if $f(c) = c$. For example, 0 is a fixed point of $f(x) = \sin x$ because $f(0) = \sin 0 = 0$.

a. Reasoning Use graphs to explain why the function $g(x) = \cos x$ has only one fixed point.

b. Graphing Calculator Find the fixed point of $g(x) = \cos x$.

PROBLEM SOLVING

EXAMPLE 3 on p. 932 for Exs. 41–42

41. **WIND SPEED** The average wind speed s (in miles per hour) in the Boston Harbor can be approximated by $s = 3.38 \sin \frac{\pi}{180}(t + 3) + 11.6$ where t is the time in days, with $t = 0$ representing January 1. On which days of the year is the average wind speed 10 miles per hour?

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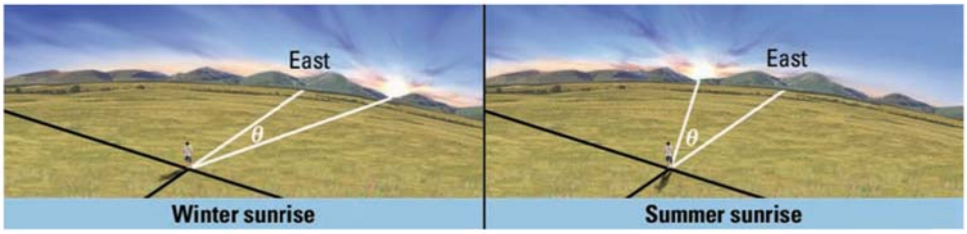
42. **TAKS REASONING** The number of degrees θ north of due east $(\theta > 0)$ or south of due east $(\theta < 0)$ that the sun rises in Cheyenne, Wyoming, can be modeled by

$$\theta(t) = 31 \sin\left(\frac{2\pi}{365}t - 1.4\right)$$

where t is the time in days, with $t = 1$ representing January 1. Use an algebraic method to find at what day(s) the sun is 20° north of due east at sunrise. *Explain* how you can use the graph of $\theta(t)$ to check your answer.



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○ = WORKED-OUT SOLUTIONS on p. WS1 = TAKS PRACTICE AND REASONING = MULTIPLE REPRESENTATIONS