4.1c

EXAMPLE 9   Solving a Vertical Motion Problem

A ball is thrown upward with an initial velocity of 64 feet per second from an initial height of 80 feet.

a. Find the position function giving the height s as a function of the time t.

b. When does the ball hit the ground?

You Try

52. With what initial velocity must an object be thrown upward (from ground level) to reach the top of the Washington Monument, which has a height of approximately 555 feet?

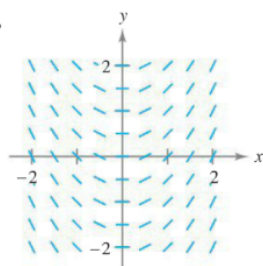use $a(t) = -32$ ft/sec²
for the accel due to gravity

Slope Fields

EXAMPLE 3   Sketching a Slope Field

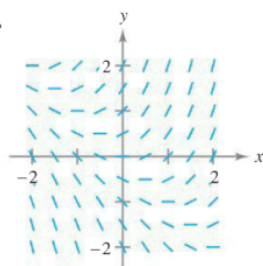Sketch a slope field for the differential equation $y' = x - y$ for the points $(-1, 1)$, $(0, 1)$, and $(1, 1)$.

EXAMPLE 4   Identifying Slope Fields for Differential Equations
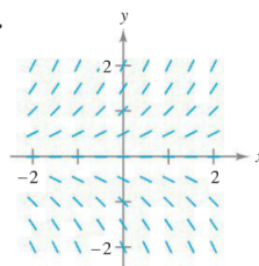
Match each slope field with its differential equation.

a.

b.

c.

i. $y' = x + y$ **ii.** $y' = x$ **iii.** $y' = y$
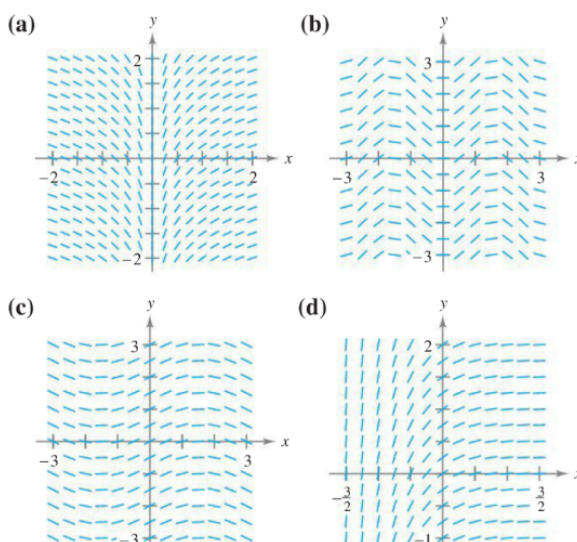
EXAMPLE 5   Sketching a Solution Using a Slope Field

Sketch a slope field for the differential equation $y' = 2x + y$. Use the slope field to sketch the solution that passes through the point $(1, 1)$.

Matching In Exercises 51–54, match the differential equation with its slope field. [The slope fields are labeled (a), (b), (c), and (d).]

(a)

(b)

(c)

(d)

51. $y' = \sin 2x$ **52.** $y' = \frac{1}{2}\cos x$

53. $y' = e^{-2x}$ **54.** $y' = x^{-1}$