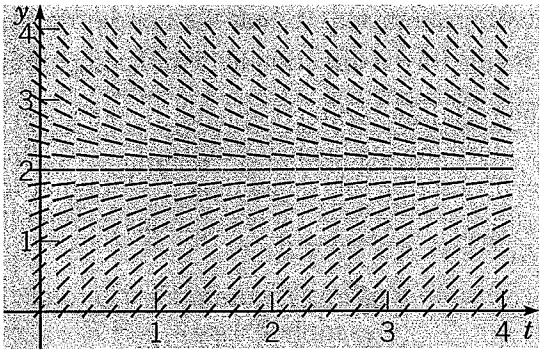

FIGURE 1.1.5 Direction field for Problem 15.

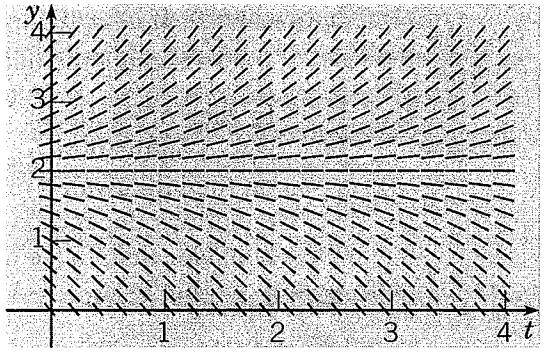

FIGURE 1.1.6 Direction field for Problem 16.

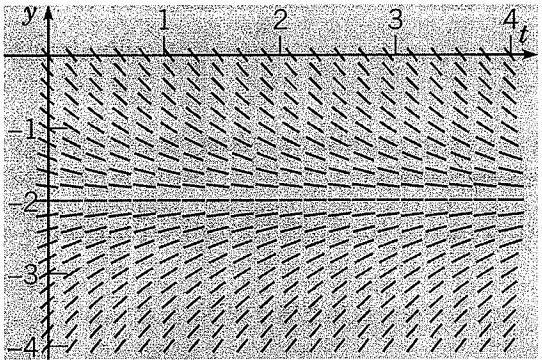

FIGURE 1.1.7 Direction field for Problem 17.

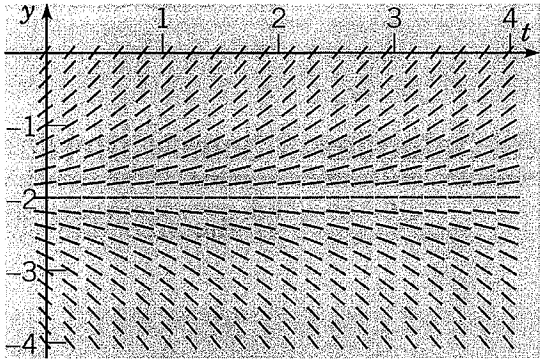

FIGURE 1.1.8 Direction field for Problem 18.

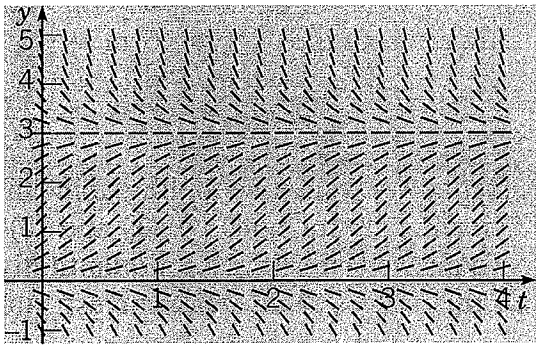

FIGURE 1.1.9 Direction field for Problem 19.

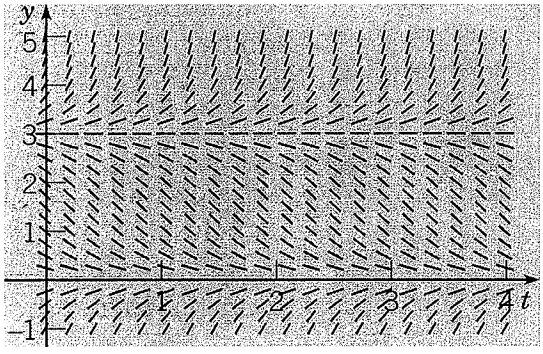

FIGURE 1.1.10 Direction field for Problem 20.

25. For small, slowly falling objects, the assumption made in the text that the drag force is proportional to the velocity is a good one. For larger, more rapidly falling objects, it is more accurate to assume that the drag force is proportional to the square of the velocity.[2]

    (a) Write a differential equation for the velocity of a falling object of mass m if the drag force is proportional to the square of the velocity.

    (b) Determine the limiting velocity after a long time.

[2]See Lyle N. Long and Howard Weiss, "The Velocity Dependence of Aerodynamic Drag: A Primer for Mathematicians," *American Mathematical Monthly 106* (1999), 2, pp. 127–135.