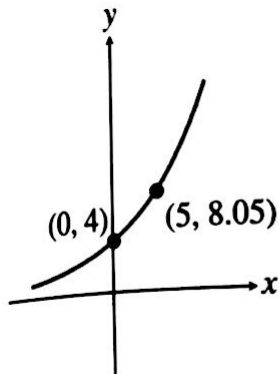
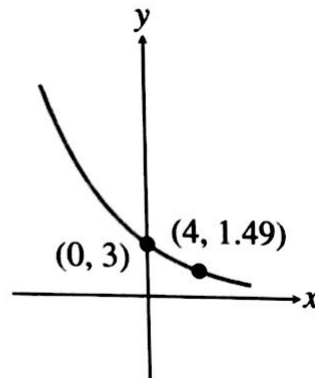


In Exercises 21 and 22, determine a formula for the exponential function whose graph is shown in the figure.

21.



22.

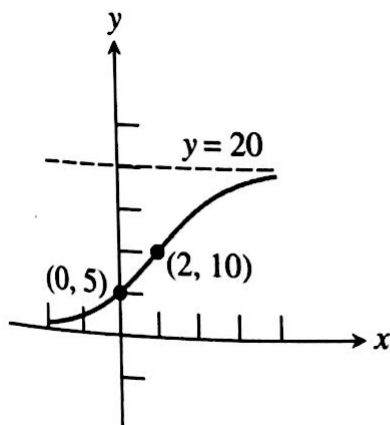


In Exercises 23–26, find the logistic function that satisfies the given conditions.

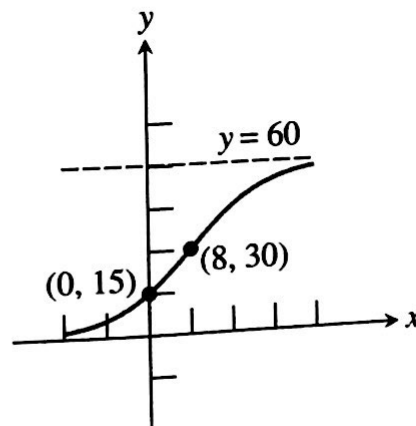
23. Initial value = 10, limit to growth = 40, passing through (1, 20).
24. Initial value = 12, limit to growth = 60, passing through (1, 24).
25. Initial population = 16, maximum sustainable population = 128, passing through (5, 32).
26. Initial height = 5, limit to growth = 30, passing through (3, 15).

In Exercises 27 and 28, determine a formula for the logistic function whose graph is shown in the figure.

27.



28.



29. **Exponential Growth** The 2000 population of Jacksonville, Florida was 736,000 and was increasing at the rate of 1.49% each year. At that rate, when will the population be 1 million?

30. **Exponential Growth** The 2000 population of Las Vegas, Nevada was 478,000 and is increasing at the rate of 6.28% each year. At that rate, when will the population be 1 million?

45. Spread of Flu The number of students infected with flu at Springfield High School after t days is modeled by the function

$$P(t) = \frac{800}{1 + 49e^{-0.2t}}$$

- (a)** What was the initial number of infected students?
- (b)** When will the number of infected students be 200?
- (c)** The school will close when 300 of the 800-student body are infected. When will the school close?