

pg. 434 # 1-23 odd, 24, 26, 32, 34, 40, 53

1. graph paper

9. graph paper

15.  $a = 50$   $b = \frac{1}{2}$   $\frac{x}{14.3}$  expresses time as parts of half life interval

$$y = 50\left(\frac{1}{2}\right)^{\frac{x}{14.3}}$$

$$y = 50\left(\frac{1}{2}\right)^{\frac{84}{14.3}} = .852 \text{ mg}$$

19. Don't graph, waste of time. Use table.  
Find  $x = 6$ . 403.4288

24.  $A = Pe^{rt}$   
 $= 2000e^{.051(3)}$   
 $= \$2330.65$

32. decay  $b < 1$   
y-int = 4  $\leftarrow a$   
another point (1, 2)

$$2 = 4b^1$$

$$\frac{1}{2} = b$$

parent function  $y = 4\left(\frac{1}{2}\right)^x$  "inside" horizontal  
Shifted function  $y = 4\left(\frac{1}{2}\right)^{x+4} + 3$  "outside" vertical

40. 4.5% compounded quarterly  $\frac{.045}{4} = .01125$

$$A = 2000(1.01125)^{4.5}$$
$$= 2501.50$$

$$A = 2000e^{.045(5)}$$
$$= 2504.65$$

$$\begin{array}{r} 2504.65 \\ - 2501.50 \\ \hline \end{array}$$

\$3.15 more with  
continuous interest

$$53. A = 500e^{.0462x}$$

$$1000 = 500e^{.0462x}$$

$$\frac{1000}{500} = \frac{500}{500}e^{.0462x}$$

$$2 = e^{.0462x}$$

use graphing calculator  
table. When is  $y$  close to 2?

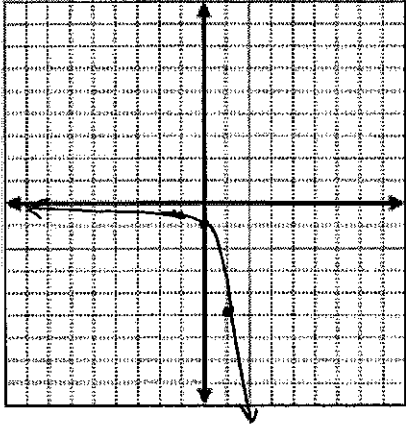
15 years (c)

$$1. -1(5)^x \quad \begin{array}{c|c|c|c|c} x & -2 & -1 & 0 & 1 & 2 \\ \hline y & \frac{1}{25} & \frac{1}{5} & -1 & -5 & -25 \end{array}$$

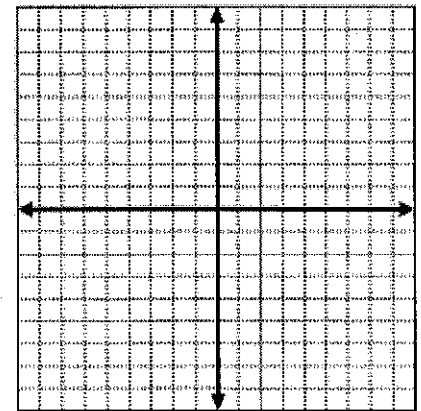
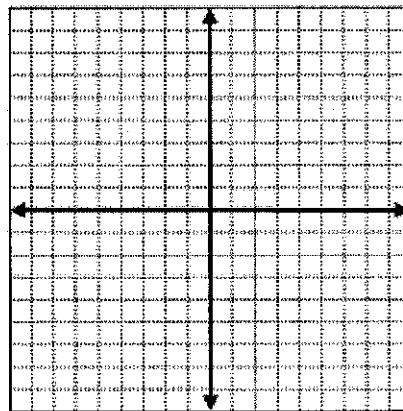
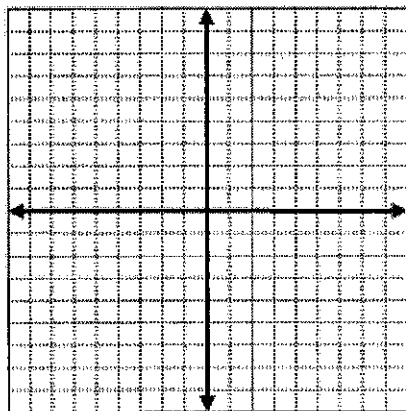
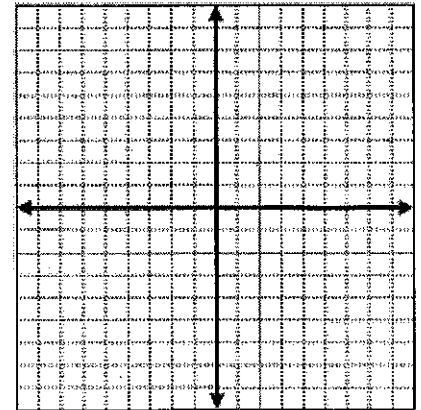
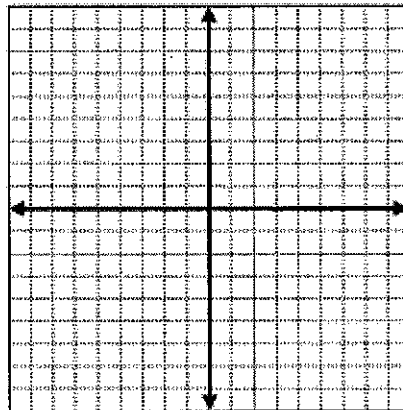
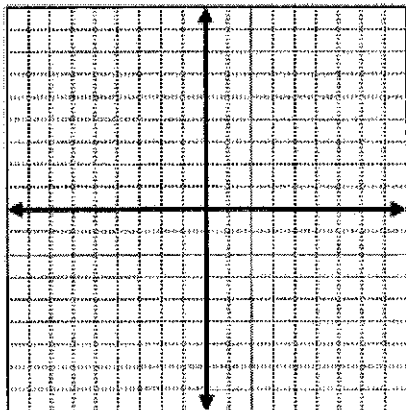
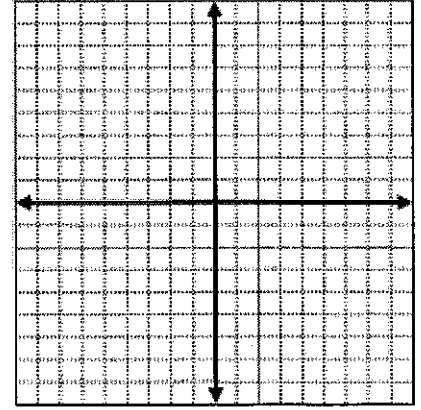
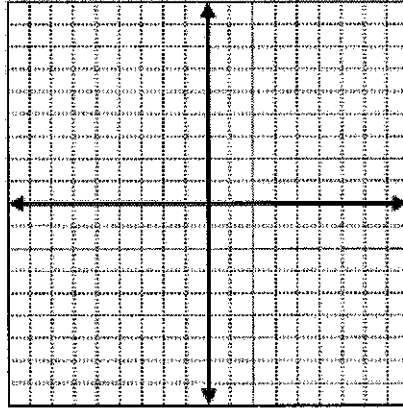
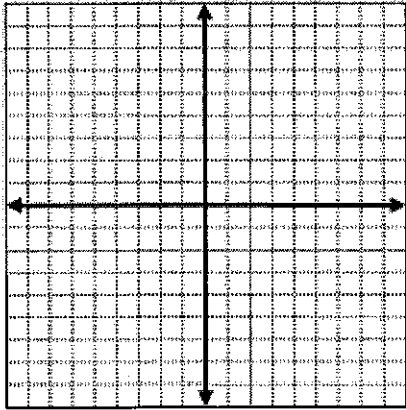
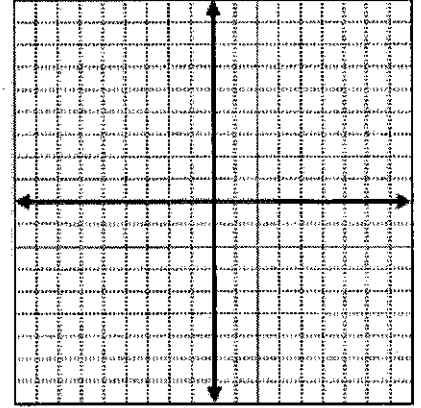
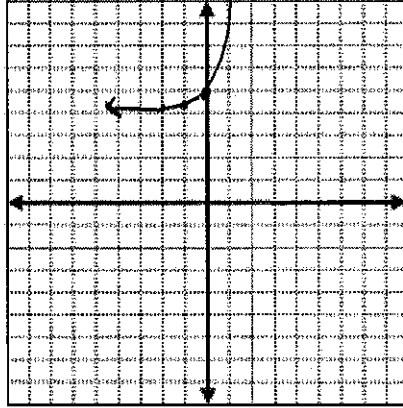
$$9. 8^x + 5$$

| x         | -2              | -1             | 0 | 1  | 2  |
|-----------|-----------------|----------------|---|----|----|
| $8^x$     | $\frac{1}{64}$  | $\frac{1}{8}$  | 1 | 8  | 64 |
| $8^x + 5$ | $\frac{51}{64}$ | $5\frac{1}{8}$ | 6 | 13 | 69 |

y=0

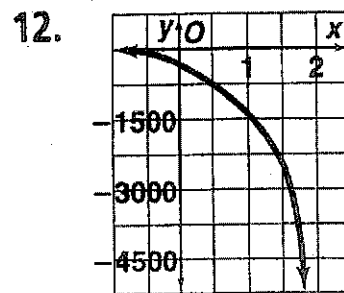
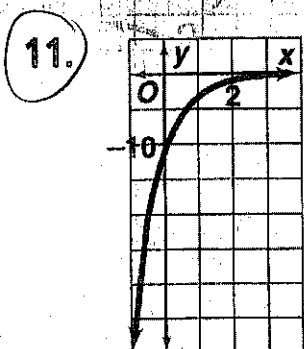
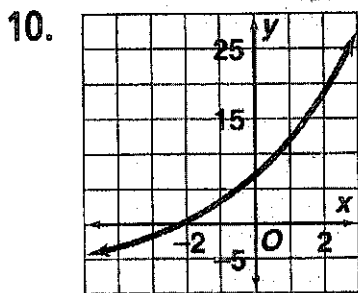
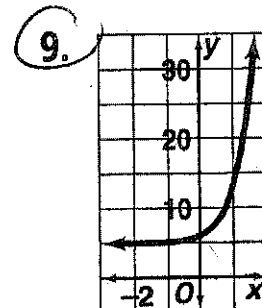
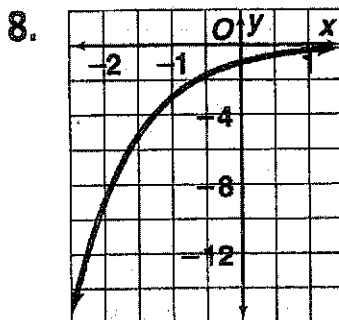
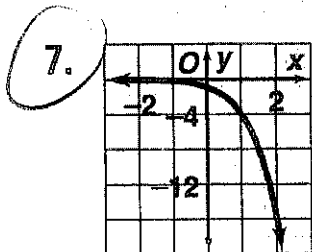
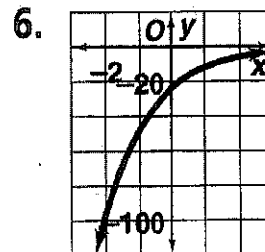
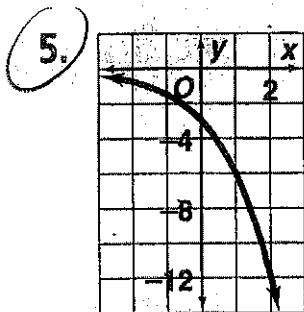
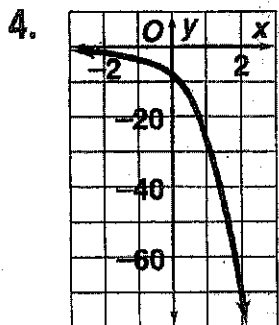
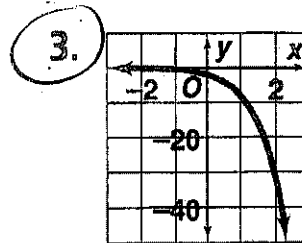
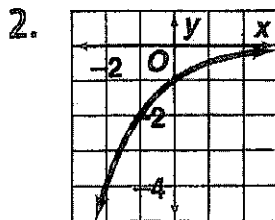
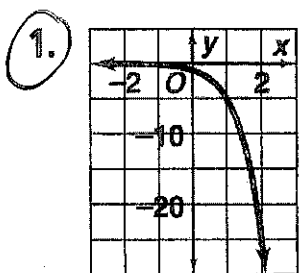


y=5

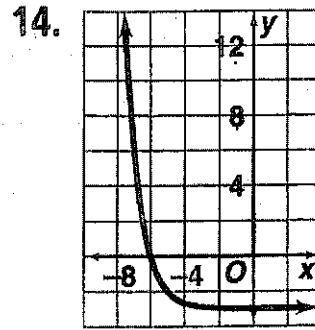
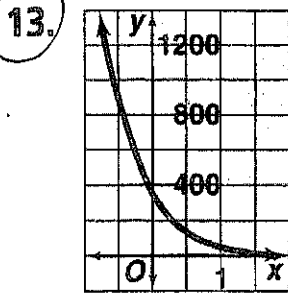


Answers for Lesson 8-2, pp. 434–437 Exercises

1-8. Asymptote is  $y = 0$ .



Answers for Lesson 8-2, pp. 434–437 Exercises (cont.)



15.  $y = 50\left(\frac{1}{2}\right)^{\frac{1}{14.3}x}$ ; 0.85 mg

16.  $y = 200\left(\frac{1}{2}\right)^{\frac{1}{8.14}x}$ ; 0.43 mg

17.  $y = 24\left(\frac{1}{2}\right)^{\frac{1}{5730}x}$ ; 0.64 mg

18. 20.0855

19. 403.4288

20. 0.1353

21. 1

22. 12.1825

23. 15.1543

24. \$2330.65

25. \$448.30

26. \$1819.76

27. 0

28. 1

29. If  $c < 0$ , the graph models exponential decay. If  $c = 0$ , the graph is a horizontal line. If  $c > 0$ , the graph models exponential growth.

30. \$6168.41

31. a. Answers may vary. Sample:  $y = -2(1.3)^x$

b. Answers may vary. Sample: I am in debt for \$2 and my debt is growing at a rate of 30% per year.

c. The graph of exponential decay approaches the asymptote  $y = 0$  as  $x$  increases. The graph of negative exponential growth approaches the asymptote  $y = 0$  as  $x$  decreases.

12. 32.  $y = 4\left(\frac{1}{2}\right)^x$ ;  $y = 4\left(\frac{1}{2}\right)^{x+4} + 3$

Answers for Lesson 8-2, pp. 434-437 Exercises (cont.)

33.  $y = -3^x$ ;  $y = -3^{x-8} + 2^{1/2}$  34.  $y = \frac{1}{2}(2)^x$ ;  $y = \frac{1}{2}(2)^{x-6} - 7$

35.  $y = -3\left(\frac{1}{3}\right)^x$ ;  $y = -3\left(\frac{1}{3}\right)^{x+5} - 1$

36. 75.0 pascals 37. 8.7 yr

38. A deficit that is growing exponentially is modeled by  $y = ab^{cx}$ , where  $a < 0$ , and either  $b > 1$  and  $c > 0$  or  $0 < b < 1$  and  $c < 0$ .

39. a. GDP =  $8.511(1.038)^t$  where  $t = 0$  corresponds to 1998 and 8.511 is trillions.

b. It almost doubles. (about 195.7%)

c. In 9 years, the growth is about 40%.

40. a. \$2501.50

b. \$3.15 more

41. \$399.97

42. exponential growth

43. exponential growth

44. exponential decay

45. exponential growth

46. exponential decay

47. exponential growth

48. a.  $y = 8001 - 3^x$ , where  $y$  is the number of uninfected people and  $x$  represents days.

b. 5814 people

c. about 9 days

49. a. about 10 names; about 24 names

b. Graphically, it will never happen; the graph has  $y = 30$  as an asymptote. (In reality, you would be close to knowing all the names in about 21 days.)

c. Answers may vary. Sample: I learn names pretty quickly; my learning rate might be 0.4.

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53) C