Answers for 7.2

For use with pages 489–491

7.2 Skill Practice

1. 1250, 0.85, 15%

2. If b is greater than 1, then the function represents exponential growth. If b is greater than 0 and less than 1, the function represents exponential decay.

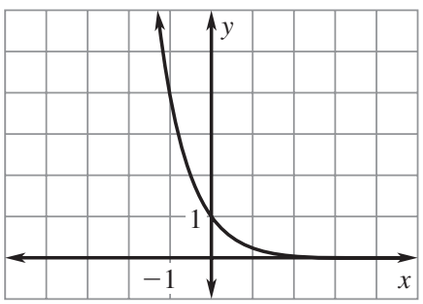
3. exponential decay

4. exponential growth

5. exponential growth

6. exponential decay

7.



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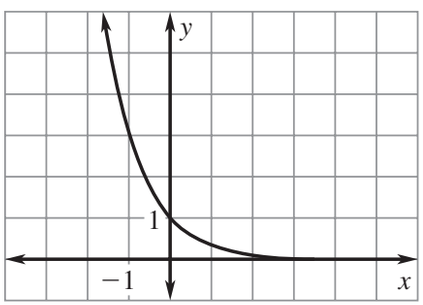

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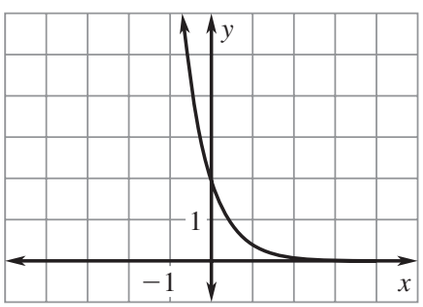

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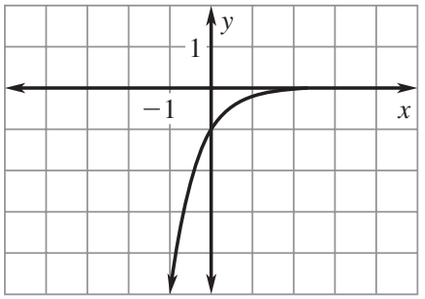

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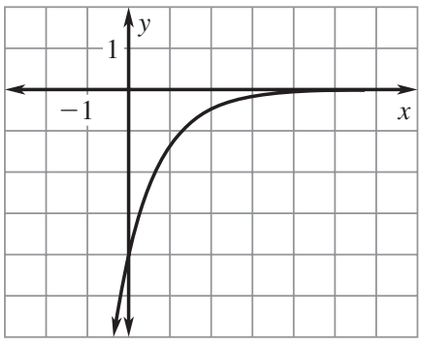

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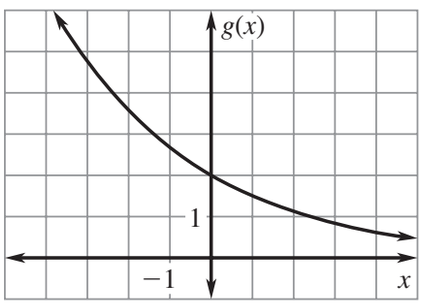

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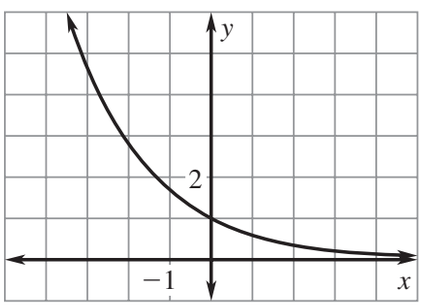

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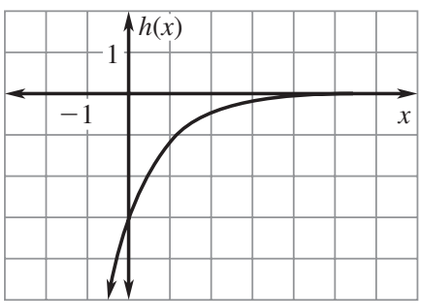
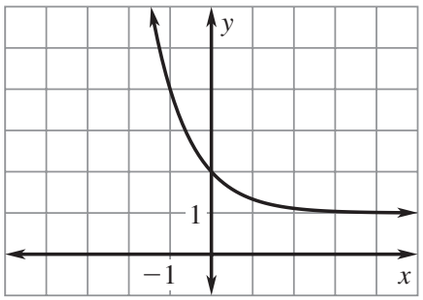


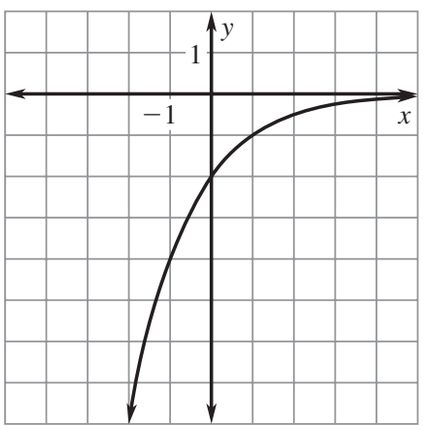
15. B

16.



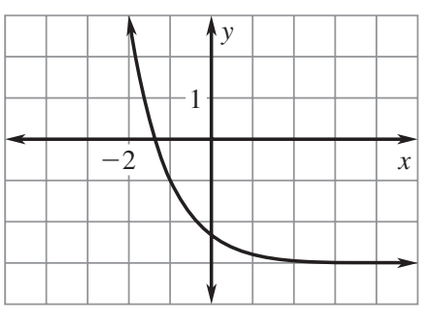
domain: all real numbers,
range: $y > 1$

17.



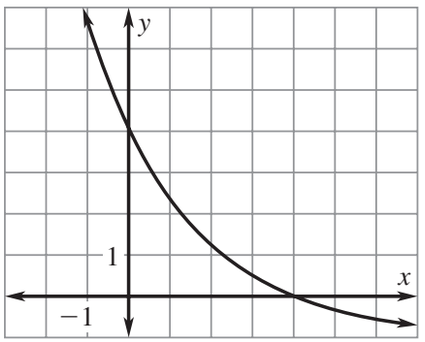
domain: all real numbers,
range: $y < 0$

18.



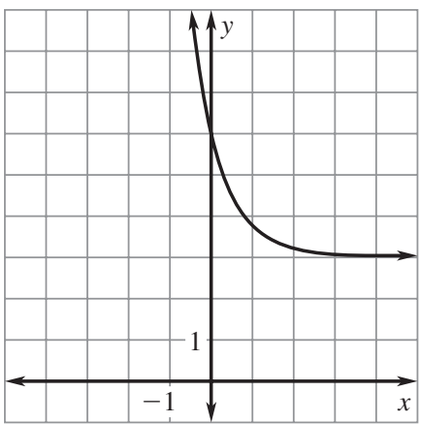
domain: all real numbers,
range: $y > -3$

19.



domain: all real numbers,
range: $y > -1$

20.



domain: all real numbers,
range: $y > 3$

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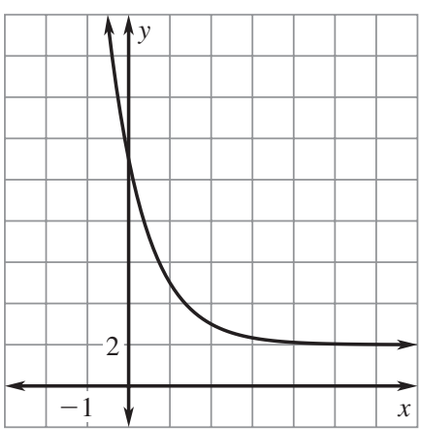
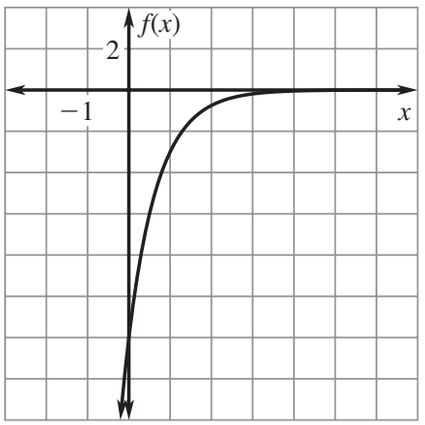


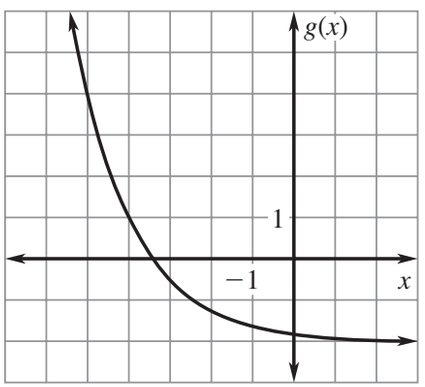
domain: all real numbers,
range: $y > 2$

22.



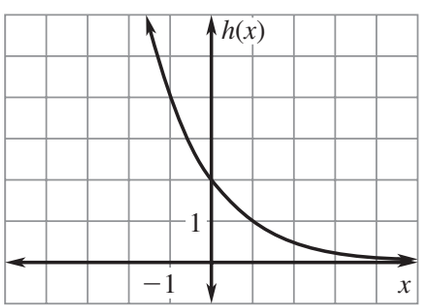
domain: all real numbers,
range: $y < 0$

23.



domain: all real numbers,
range: $y > -2$

24.



domain: all real numbers,
range: $y > 0$

25. a. The graph is a vertical stretch by a factor of $\frac{4}{3}$.

b. The graph will be steeper because the decay factor is smaller.

c. The graph moves 5 units to the right instead of 2 units to the right.

d. The horizontal asymptote moves to $x = 3$.

26. The decay factor is $1 - r$, not r; $y = 500(0.98)^t$.

27. D

28. *Sample answer:* $(0.3)^x + 1$

29. Yes; $5(4)^{-x} = 5\left(\frac{1}{4}\right)^x$ and 0.25 is the decimal equivalent to $\frac{1}{4}$.

7.2 Problem Solving

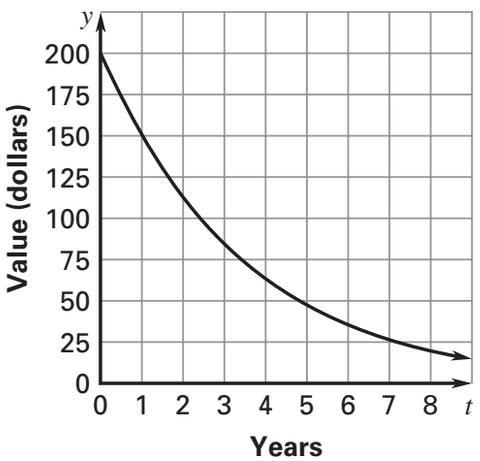
30. a. about 119.65 mg

b. about 98.01 mg

c. about 72.17 mg

31. a. $y = 200(0.75)^t$; about \$84.38

b.



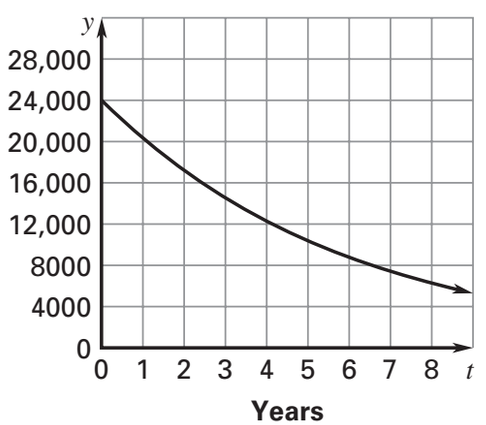
c. after about 2.5 yr

32. $\frac{1832}{1906} \approx 0.96$; $\frac{1762}{1832} \approx 0.96$;

$\frac{1692}{1762} \approx 0.96$; $\frac{1627}{1692} \approx 0.96$;

$d = 1985(0.96)^t$

33. a.

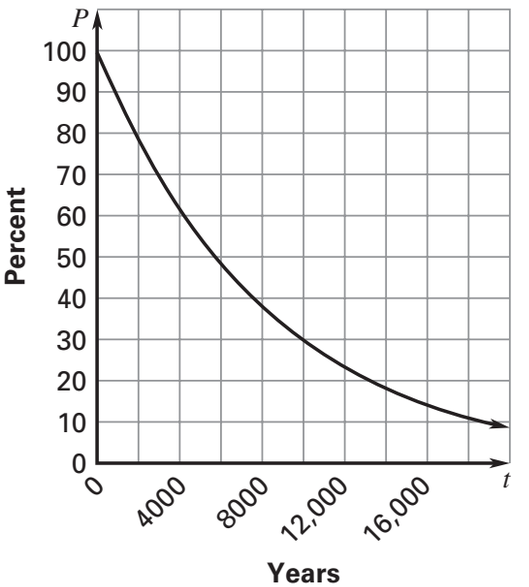


after 5 yr

b. \$5.29; no. *Sample answer:* A car does not normally last 50 years.

34. a. about 73.9%; about 54.6%; about 29.8%

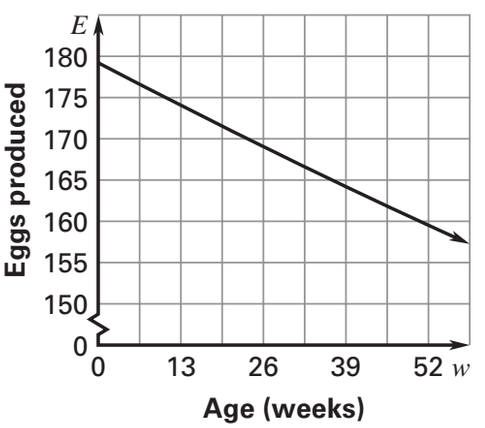
b.



c. about 8000 yr

35. a. 0.89, 11%

b.



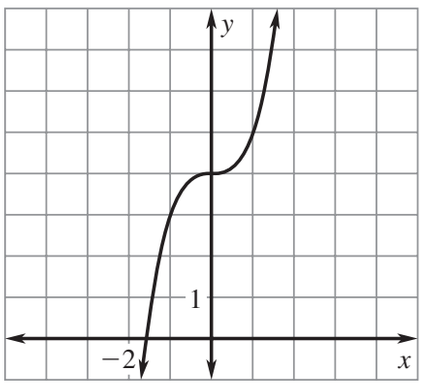
c. about 134 eggs per yr

d. Change the exponent to just w.

36. $V = 1300(0.678)^t$

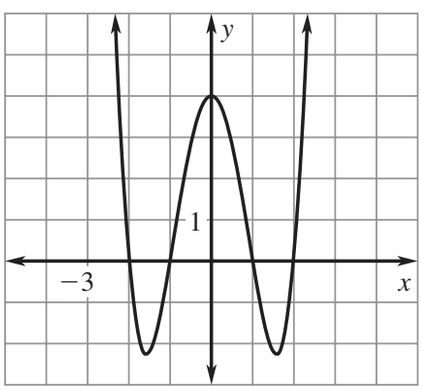
7.2 Mixed Review

37.



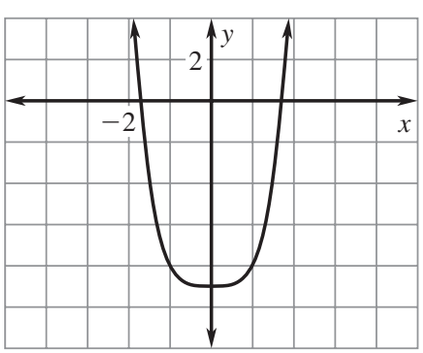
domain: all real numbers,
range: all real numbers

38.



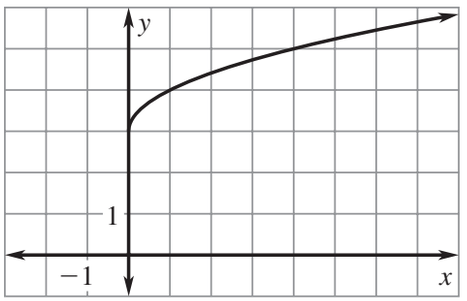
domain: all real numbers,
range: $y > -2.25$

39.



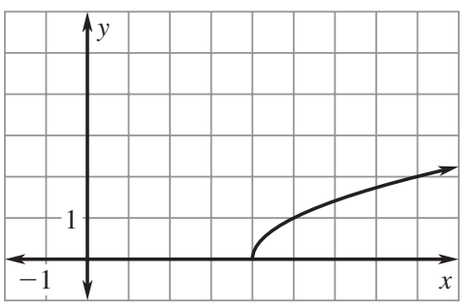
domain: all real numbers,
range: $y > -9$

40.



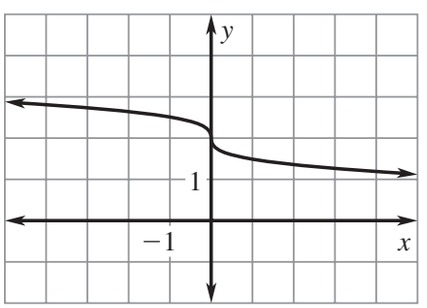
domain: $x > 0$,
range: $y > 3$

41.



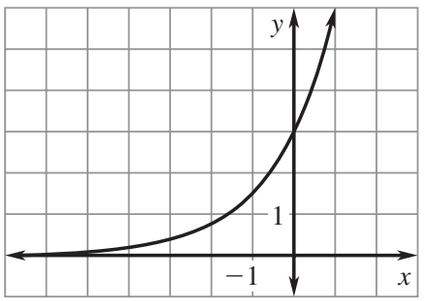
domain: $x > 4$,
range: $y > 0$

42.



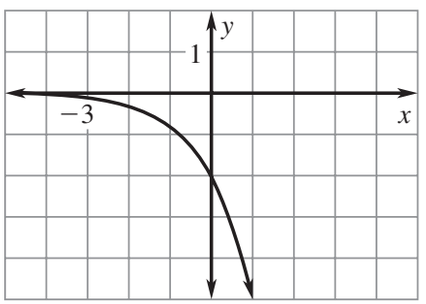
domain: all real numbers,
range: all real numbers

43.



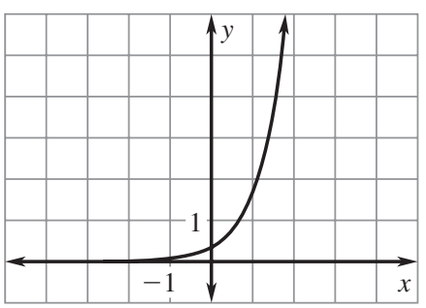
domain: all real numbers,
range: $y > 0$

44.



domain: all real numbers,
range: $y < 0$

45.



domain: all real numbers,
range: $y > 0$

46. $f(g(x)) = 5\left(\frac{x+2}{5}\right) - 2 = x,$

$$g(f(x)) = \frac{5x - 2 + 2}{5} = x$$

47. $f(g(x)) = -3\left(\frac{10-x}{3}\right) + 10 = x,$

$$g(f(x)) = \frac{10 - (-3x + 10)}{3} = x$$

48. $f(g(x)) = 4\left(\left(\frac{x+7}{4}\right)^{1/3}\right)^3 - 7 = x,$

$$g(f(x)) = \left(\frac{(4x^3 - 7) + 7}{4}\right)^{1/3} = x$$

49. $f(g(x)) = \frac{(\sqrt[5]{12x - 7})^5 + 7}{12} = x,$

$$g(f(x)) = \sqrt[5]{12\left(\frac{x^5 + 7}{12}\right) - 7} = x$$