3.4 p229

57.

$$\left(1+\frac{.065}{365}\right)^{365t}=4$$

$$(1.000178082)^{365t}=4$$

$$\log(1.000178082)^{365t}=\log 4$$

$$365t(\log 1.000178082)$$

$$.0282266281t=\log 4$$

$$t=21.3$$

77.

$$\ln x + \ln(x-2) = 1$$

$$\ln(x(x-2)) = 1$$

$$\ln x^2 - 2x = 1$$

$$e^{\ln x^2 - 2x} = e^1$$

$$x^2 - 2x = 2.718$$

$$-2.718 \quad -2.718$$

$$x^2 - 2x - 2.718 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(-2.718)}}{2(1)}$$

$$x =$$

29. 3.5 p 240

p234.

$$R = \frac{1}{8^{14}}$$

$$R = \frac{1}{10^{12}} e^{\frac{-t}{8223}}$$

$$10^{12} \frac{1}{8^{14}} = \frac{10^{12}}{10^{12}} e^{\frac{-t}{8223}}$$

$$\frac{10^{12}}{8^{14}} = e^{\frac{-t}{8223}}$$

$$\ln \frac{10^{12}}{8^{14}} = \ln e^{\frac{-t}{8223}}$$

$$-8223 \quad -1.48116 = \frac{-t}{8223} \quad \cdot -8223$$

$$12{,}179.59 = t$$

53. 3.5

$pH = -\log_{10}[H^+]$

Grape $3.5 = -\log_{10}[H^+]$

$10^{3.5} = 10^{-\log_{10}[H^+]}$

$-3162.278 = [H^+]$

B. Soda $8 = -\log_{10}[H^+]$

$10^{8} = 10^{-\log_{10}[H^+]}$

$-100,000,000 = [H^+]$

31,623

51. 3.5 Calc

Ch. Test p250

5

Orig. $t=0$

$f(0) = 87 - 15\log_{10}(0+1)$

$f(0) = 87 - 15\log_{10} 1$

$f(0) = 87 - 0$

$f(0) = 87$

$f(2) = 87 - 15\log_{10}(2+1)$

$f(2) = 87 - 15\log 3$

$f(2) = 87 - 7.157$

$f(2) = 79.843$

$f(4) = 87 - 15\log(4+1)$

$f(4) = 87 - 15\log 5$

$f(4) = 87 - 10.484$

$f(4) = 76.515$