- A radioactive substance decays in such a way that the amount of mass remaining 1. after t days is given by the function $m(t) = 13e^{-0.015t}$ where m(t) is measured in
 - Find the mass at t=0a.)

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How much mass remains after 5 days? b.)

The amount of time it takes to double the amount of an investment at an interest 2. rate r compounded continuously is given by the formula $t = \frac{\ln 2}{r}$. Find the time required to double an investment at 6%, 2% and 19%.

- Solve each equation. 3.
 - a.) $\log_2 x = 5$

25 = > x = 32

lnx = 10

 $4 + 3^{5x} = 8$ e.)

x = .21 $100(1.04)^{2t} = 300$

2 Kini. 34 1 103

b.) $log_4 2 = x$

(2x-1/123 = 122

X=1.23

 $e^{2x+1} = 200$ f.)

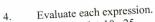
2x 41 = 1-200

 $4(1+10^{5x}) = 9$

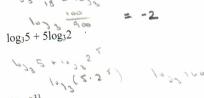
1000 × 1.52

5x losie = 1051 65

119 = V



b.)
$$\log_3 100 - 10g_3 18 - \log_3 50$$



e.)
$$\ln 5 + 2\ln x - 2\ln(x^2 + 5)$$

$$\ln 5 + \ln x - \ln(x^2 + 5)$$

$$\ln \left(\frac{5 \times 2}{(x^2 + 5)^2}\right)$$

f.)
$$\log_2 8^{33}$$

Use the laws of Logarithms to expand each expression.

a.)
$$\log_2(2x)$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

$$\log_2(xy)^{10}$$

d.)

- A culture contains 1500 bacteria and doubles every 30 minutes. 7.
 - Find a function that models the number of bacteria after t minutes.

Find the number of bacteria after 2 hours. b.)

After how many minutes will the culture contain 4000 bacteria? c.)

8. The velocity of a skydiver t seconds after jumping is given by $v(t) = 80(1-e^{-0.2t})$. After how many seconds is the velocity 70 ft/sec?

9. A sum of \$1000 was invested for 4 years, and the interest was compounded semiannually. If this sum amounted to \$1453.77 in the given time, what was the interest rate?

$$| book (| + \frac{c}{2})^{2} + | 453.77$$

$$(| + \frac{c}{2} |^{3} + | 1453.77)$$

$$| + \frac{c}{2} = | 04786$$

$$| \frac{c}{2} = | 04786$$

$$| \frac{c}{2} = | 04786$$

10. Solve for x: $\log_2(\log_3 x) = 4$

- 11. The fox population in Blue Hills has a continuous growth rate of 8% per year. It s estimated that the population in 2000 was 5600.
 - a.) Find a function that models the population t years after 2000.

b.) Use the function to estimate the number of foxes in 2010.

- 12. The population of California was 10,586,223 in 1950 and 23,668,562 in 1980. Assume the population grows exponentially.
 - a.) Find a function that models the population t years after 1950.

b.) Determine how long it takes the population to double.

c.) Use your function to determine the population of CA in 2000. How far is is from the actual population of 33,871,648?