

Unit 2, Day 6 HOMEWORK

Name KEY

Solve the following:

1. $140\left(\frac{1}{2}\right)^{\frac{t}{4}} = 350$

$t = -5.29$

2. $3\log(u-7) = 6$

$u = 107$

3. $3^{t-4} = 48$

$t = 7.52$

4. $e^{-x} - 6 = 9$

$x = -2.71$

5. $9 - 4e^x = 5$

$x = 0$

6. $10^{2x-3} + 4 = 21$

$x = 2.12$

7. Find the inverse of the function:

a. $y = \log_3 x$

$y = 3^x$

b. $y = \ln(x+1)$

$y = e^x - 1$

8. Since 1972 the U.S. Fish and Wildlife Service has kept a list of endangered species in the US. For the years 1972-1998, the number (s) of species on the list can be modeled by: $S = 119.6e^{0.0917t}$ Where t is the number of years since 1972.

a. What was the number of endangered species in 1972?

119.6

b. Use the equation to find when the number of species reached 1000.

$t = 23.2 \text{ years}$

9. The moment magnitude M of an earthquake that releases energy N (in ergs) can be modeled by:

$M = 0.291 \ln N + 1.17$

On May 22, 1960, a powerful earthquake took place in Chile. It had a moment magnitude of 9.5. How much energy did this earthquake release?

$2.703 \times 10^{12} \text{ ergs}$