

1. The half-life of a substance is 4 minutes. The original mass is 100 grams. How much of the substance remains after 15 minutes?

2. Write a logistic function if:

Initial value = 10, Limit to growth = 50, Passes through (2,30)

**Solve for x:**

3.  $\log(x+1) - \log(2x-1) = \frac{1}{2} \log 4$

4.  $\log_4(x-3) = -1$

5.  $1 + 2e^{-2x} = 6$

6.  $\left(\frac{1}{4}\right)^{4x-1} = 8^{3x}$

7. Write the equation of an exponential function that goes through (0,2) and (3,12). (Round b-value to nearest hundredths.)
8. The population of Chicago has been increasing at 1.2% per year. If the population is 3,000,000 in 2000, when will the population reach 3,500,000?