



Exponential Function Solving - Decay (Continuous) Scenario to Value at Time

1

How would you solve for the final population given this scenario?

A bacteria population starts at 300. It declines continuously at 5% per year. After 6 years it has decreased to a certain population.

A	B
$P = P_0 - e^{(-r \cdot t)}$	$P = P_0 \cdot e^{(-r \cdot t)}$

2

How would you solve for the final population given this scenario?

A whale population starts at 700. It declines continuously at 3% per year. After 9 years it has decreased to a certain population.

A	B
$P = P_0 - e^{(-r \cdot t)}$	$P = P_0 \cdot e^{(-r \cdot t)}$

3

How would you solve for the final concentration given this scenario?

A toxin starts at a concentration of 200mg/L. It declines continuously at 7% per month. After 4 months it has decreased to a certain concentration.

$\hat{C} = C_0 \cdot e^{(-r \cdot t)}$	$\hat{C} = C_0 - e^{(-r \cdot t)}$
$\hat{C} = C_0 \cdot e^{(\frac{-r}{t})}$	

4

How would you solve for the final concentration given this scenario?

A radioactive material starts at an isotope concentration of 900ppm. It decays continuously at 8% per day. After 3 days it has decayed to a certain isotope concentration.

$\hat{R} = R_0 - e^{(-r \cdot t)}$	$\hat{R} = R_0 \cdot e^{(\frac{-r}{t})}$
$\hat{R} = R_0 \cdot e^{(-r \cdot t)}$	

5

How would you solve for the final population given this scenario?

A bird population starts at 200. It declines continuously at 6% per quarter. After 8 quarters it has decreased to a certain population.

$\hat{P} = P_0 \cdot e^{(-r \cdot t)}$	$\hat{P} = P_0 \cdot e^{(\frac{-r}{t})}$
$\hat{P} = P_0 - e^{(-r \cdot t)}$	

6

How would you solve for the final concentration given this scenario?

A toxin starts at a concentration of 700mg/L. It declines continuously at 2% per month. After 6 months it has decreased to a certain concentration.

$\hat{C} = C_0 \cdot e^{(-r \cdot t)}$	$\hat{C} = C_0 - e^{(-r \cdot t)}$
$\hat{C} = C_0 \cdot e^{(\frac{-r}{t})}$	

7

How would you solve for the final population given this scenario?

A bacteria population starts at 200. It declines continuously at 7% per month. After 9 months it has decreased to a certain population.

$\hat{P} = P_0 - e^{(-r \cdot t)}$	$\hat{P} = P_0 \cdot e^{(-r \cdot t)}$
$\hat{P} = P_0 \cdot e^{(\frac{-r}{t})}$	

8

How would you solve for the final population given this scenario?

A bacteria population starts at 500. It declines continuously at 2% per month. After 6 months it has decreased to a certain population.

$\hat{P} = P_0 - e^{(-r \cdot t)}$	$\hat{P} = P_0 \cdot e^{(\frac{-r}{t})}$
$\hat{P} = P_0 \cdot e^{(-r \cdot t)}$	