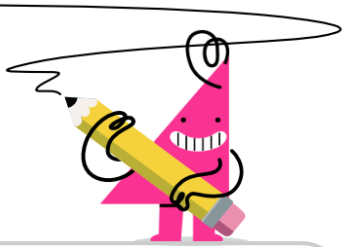
Name



Exponential Function Solving - Decay (Continuous, Mis-matched Time Units) Scenario to Starting Value

1

A bird population starts at a certain size. It declines continuously at 4% per year. After 2 quarters it has decreased to a population of 461.

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

A $P_0 = \frac{P}{e^{(-r \cdot \frac{t}{4})}}$

B $P_0 = \frac{P}{e^{(\frac{-r}{t \cdot 4})}}$

C $P_0 = \frac{e^{(-r \cdot \frac{t}{4})}}{P}$

2

A toxin starts at a certain concentration. It declines continuously at 2% per week. After 8 days it has decreased to a concentration of 596mg/L.

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

A $C_0 = \frac{e^{(-r \cdot \frac{t}{7})}}{C}$

B $C_0 = \frac{C}{e^{(\frac{-r}{t \cdot 7})}}$

C $C_0 = \frac{C}{e^{(-r \cdot \frac{t}{7})}}$

3

A radioactive material starts at a certain isotope concentration. It decays continuously at 3% per hour. After 8 days it has decayed to an isotope concentration of 550ppm.

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

A $R_0 = \frac{R}{e^{(-r \cdot t \cdot 24)}}$

B $R_0 = \frac{R}{e^{(\frac{-r}{t \cdot 24})}}$

C $R_0 = \frac{e^{(-r \cdot t \cdot 24)}}{R}$

4

A bird population starts at a certain size. It declines continuously at 6% per quarter. After 8 years it has decreased to a population of 309.

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

A $P_0 = \frac{e^{(-r \cdot t \cdot 4)}}{P}$

B $P_0 = \frac{P}{e^{(\frac{-r}{t \cdot 4})}}$

C $P_0 = \frac{P}{e^{(-r \cdot t \cdot 4)}}$

5

A whale population starts at a certain size. It declines continuously at 7% per year. After 4 quarters it has decreased to a population of 680 whales.

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

A $P_0 = \frac{P}{e^{(-r \cdot \frac{t}{4})}}$

B $P_0 = \frac{P}{e^{(\frac{-r}{t \cdot 4})}}$

6

A bird population starts at a certain size. It declines continuously at 6% per year. After 2 quarters it has decreased to a population of 798.

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

A $P_0 = \frac{P}{e^{(\frac{-r}{t \cdot 4})}}$

B $P_0 = \frac{e^{(-r \cdot \frac{t}{4})}}{P}$

C $P_0 = \frac{P}{e^{(-r \cdot \frac{t}{4})}}$

7

A whale population starts at a certain size. It declines continuously at 2% per year. After 4 quarters it has decreased to a population of 830 whales.

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

A $P_0 = \frac{e^{(-r \cdot \frac{t}{4})}}{P}$

B $P_0 = \frac{P}{e^{(-r \cdot \frac{t}{4})}}$

8

A bacteria population starts at a certain size. It declines continuously at 7% per day. After 6 weeks it has decreased to a population of 197 bacteria.

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

A $P_0 = \frac{e^{(-r \cdot t \cdot 7)}}{P}$

B $P_0 = \frac{P}{e^{(\frac{-r}{t \cdot 7})}}$

C $P_0 = \frac{P}{e^{(-r \cdot t \cdot 7)}}$