



## Exponential Function Solution Equation - Decay (Continuous, Mis-matched Time Units) Scenario to Rate

1

A bacteria population starts at 400. It declines continuously at a certain percent per year. After 3 months it has decreased to a population of 314 bacteria.

Rearrange the exponential equation to solve for for the rate given this scenario?

A  $r = -\frac{\ln \frac{314}{400}}{3 \cdot 12}$

B  $r = -\frac{e^{\frac{314}{400}}}{\frac{3}{12}}$

C  $r = -\frac{\ln \frac{314}{400}}{\frac{3}{12}}$

A radioactive material starts at an isotope concentration of 800ppm. It decays continuously at a certain percent per day. After 6 weeks it has decayed to an isotope concentration of 709ppm.

Rearrange the exponential equation to solve for for the rate of decay given this scenario?

A  $r = -\frac{\ln \frac{709}{800}}{\frac{6}{7}}$

B  $r = -\frac{e^{\frac{709}{800}}}{6 \cdot 7}$

C  $r = -\frac{\ln \frac{709}{800}}{6 \cdot 7}$

3

A whale population starts at 400. It declines continuously at a certain percent per quarter. After 2 years it has decreased to a population of 376 whales.

Rearrange the exponential equation to solve for for the rate given this scenario?

A  $r = -\frac{\ln \frac{376}{400}}{2 \cdot 4}$

B  $r = -\frac{\ln \frac{400}{376}}{\frac{2}{4}}$

C  $r = -\frac{e^{\frac{376}{400}}}{2 \cdot 4}$

4

A radioactive material starts at an isotope concentration of 800ppm. It decays continuously at a certain percent per hour. After 9 days it has decayed to an isotope concentration of 668ppm.

Rearrange the exponential equation to solve for for the rate of decay given this scenario?

A  $r = -\frac{e^{\frac{668}{800}}}{9 \cdot 24}$

B  $r = -\frac{\ln \frac{668}{800}}{9 \cdot 24}$

C  $r = -\frac{\ln \frac{800}{668}}{\frac{9}{24}}$

5

A bacteria population starts at 700. It declines continuously at a certain percent per year. After 4 months it has decreased to a population of 508 bacteria.

Rearrange the exponential equation to solve for for the rate given this scenario?

A  $r = -\frac{\ln \frac{508}{700}}{\frac{4}{12}}$

B  $r = -\frac{\ln \frac{700}{508}}{4 \cdot 12}$

C  $r = -\frac{e^{\frac{508}{700}}}{\frac{4}{12}}$

6

A radioactive material starts at an isotope concentration of 600ppm. It decays continuously at a certain percent per day. After 5 hours it has decayed to an isotope concentration of 402ppm.

Rearrange the exponential equation to solve for for the rate of decay given this scenario?

A  $r = -\frac{\ln \frac{600}{402}}{5 \cdot 24}$

B  $r = -\frac{e^{\frac{402}{600}}}{\frac{5}{24}}$

C  $r = -\frac{\ln \frac{402}{600}}{\frac{5}{24}}$

7

A bird population starts at 900. It declines continuously at a certain percent per year. After 5 quarters it has decreased to a population of 774.

Rearrange the exponential equation to solve for for the rate given this scenario?

A  $r = -\frac{\ln \frac{774}{900}}{\frac{5}{4}}$

B  $r = -\frac{\ln \frac{900}{774}}{5 \cdot 4}$

8

A bird population starts at 800. It declines continuously at a certain percent per quarter. After 2 years it has decreased to a population of 753.

Rearrange the exponential equation to solve for for the rate given this scenario?

A  $r = -\frac{\ln \frac{800}{753}}{\frac{2}{4}}$

B  $r = -\frac{\ln \frac{753}{800}}{2 \cdot 4}$

C  $r = -\frac{e^{\frac{753}{800}}}{2 \cdot 4}$