Name

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

**1** Solve for the rate given this model of a continuous reduction of a toxin concentration?

$$209 = 300 \cdot e^{(-r \cdot 4 \cdot 24)}$$

A $r = -\frac{\ln \frac{C}{C_0}}{t \cdot 24}$

B $r = -\frac{\ln \frac{C_0}{C}}{\frac{t}{24}}$

C $r = -\frac{e^{\frac{C}{C_0}}}{t \cdot 24}$

**2** Solve for the rate given this model of a continuous decline of a bird population?

$$340 = 700 \cdot e^{(-r \cdot 8 \cdot 4)}$$

A $r = -\frac{\ln \frac{P_0}{P}}{\frac{t}{4}}$

B $r = -\frac{\ln \frac{P}{P_0}}{t \cdot 4}$

**3** Solve for the rate of decay given this model of a continuous decay of a radioactive material?

$$334 = 400 \cdot e^{(-r \cdot 9 \cdot 7)}$$

A $r = -\frac{\ln \frac{R}{R_0}}{t \cdot 7}$

B $r = -\frac{e^{\frac{R}{R_0}}}{t \cdot 7}$

C $r = -\frac{\ln \frac{R_0}{R}}{\frac{t}{7}}$

**4** Solve for the rate given this model of a a continuously declining bacteria population?

$$736 = 900 \cdot e^{(-r \cdot 4 \cdot 7)}$$

A $r = -\frac{\ln \frac{P}{P_0}}{t \cdot 7}$

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

C $r = -\frac{\ln \frac{P_0}{P}}{\frac{t}{7}}$

**5** Solve for the rate of decay given this model of a continuous decay of a radioactive material?

$$344 = 400 \cdot e^{(-r \cdot \frac{5}{7})}$$

A $r = -\frac{\ln \frac{R_0}{R}}{t \cdot 7}$

B $r = -\frac{e^{\frac{R}{R_0}}}{\frac{t}{7}}$

C $r = -\frac{\ln \frac{R}{R_0}}{\frac{t}{7}}$

**6** Solve for the rate given this model of a a continuously declining bacteria population?

$$584 = 700 \cdot e^{(-r \cdot \frac{3}{7})}$$

A $r = -\frac{\ln \frac{P}{P_0}}{\frac{t}{7}}$

B $r = -\frac{\ln \frac{P_0}{P}}{t \cdot 7}$

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

**7** Solve for the rate given this model of a continuous decline of a whale population?

$$152 = 200 \cdot e^{(-r \cdot 3 \cdot 4)}$$

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

B $r = -\frac{\ln \frac{P}{P_0}}{t \cdot 4}$

**8** Solve for the rate of decay given this model of a continuous decay of a radioactive material?

$$361 = 400 \cdot e^{(-r \cdot 5 \cdot 24)}$$

A $r = -\frac{\ln \frac{R}{R_0}}{t \cdot 24}$

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

C $r = -\frac{\ln \frac{R_0}{R}}{\frac{t}{24}}$