Name ______________________

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

1

A radioactive material starts at an isotope concentration of 200ppm. It decays continuously at 3% per hour. After a certain number of days it has decayed to an isotope concentration of 152ppm.

How would you solve for the time given this scenario?

A $t = -\frac{1}{24} \cdot \frac{r}{\ln \frac{R}{R_0}}$	B $t = -\frac{1}{24} \cdot \frac{\ln \frac{R}{R_0}}{r}$
C $t = -24 \cdot \frac{\ln \frac{R}{R_0}}{r}$	D $t = -24 \cdot \frac{\ln R \cdot R_0}{r}$

2

A bird population starts at 600. It declines continuously at 4% per year. After a certain number of quarters it has decreased to a population of 491.

How would you solve for the time given this scenario?

A $t = -4 \cdot \frac{\ln \frac{P}{P_0}}{r}$	B $t = -4 \cdot \frac{r}{\ln \frac{P}{P_0}}$
C $t = -\frac{1}{4} \cdot \frac{\ln \frac{P}{P_0}}{r}$	

3

A bird population starts at 200. It declines continuously at 3% per quarter. After a certain number of years it has decreased to a population of 152.

How would you solve for the time given this scenario?

A $t = -\frac{1}{4} \cdot \frac{r}{\ln \frac{P}{P_0}}$	B $t = -\frac{1}{4} \cdot \frac{\ln \frac{P}{P_0}}{r}$
C $t = -4 \cdot \frac{\ln P \cdot P_0}{r}$	

4

A bird population starts at 400. It declines continuously at 3% per quarter. After a certain number of years it has decreased to a population of 324.

How would you solve for the time given this scenario?

A $t = -4 \cdot \frac{\ln P \cdot P_0}{r}$	B $t = -4 \cdot \frac{\ln \frac{P}{P_0}}{r}$
C $t = -\frac{1}{4} \cdot \frac{\ln \frac{P}{P_0}}{r}$	D $t = -\frac{1}{4} \cdot \frac{r}{\ln \frac{P}{P_0}}$

5

A radioactive material starts at an isotope concentration of 400ppm. It decays continuously at 2% per week. After a certain number of days it has decayed to an isotope concentration of 340ppm.

How would you solve for the time given this scenario?

A $t = -7 \cdot \frac{\ln \frac{R}{R_0}}{r}$	B $t = -\frac{1}{7} \cdot \frac{\ln \frac{R}{R_0}}{r}$
C $t = -7 \cdot \frac{r}{\ln \frac{R}{R_0}}$	

6

A radioactive material starts at an isotope concentration of 700ppm. It decays continuously at 3% per day. After a certain number of weeks it has decayed to an isotope concentration of 602ppm.

How would you solve for the time given this scenario?

A $t = -7 \cdot \frac{\ln \frac{R}{R_0}}{r}$	B $t = -7 \cdot \frac{\ln R \cdot R_0}{r}$
C $t = -\frac{1}{7} \cdot \frac{\ln \frac{R}{R_0}}{r}$	

7

A whale population starts at 200. It declines continuously at 6% per quarter. After a certain number of years it has decreased to a population of 131 whales.

How would you solve for the time given this scenario?

A $t = -4 \cdot \frac{\ln \frac{P}{P_0}}{r}$	B $t = -\frac{1}{4} \cdot \frac{r}{\ln \frac{P}{P_0}}$
C $t = -\frac{1}{4} \cdot \frac{\ln \frac{P}{P_0}}{r}$	

8

A radioactive material starts at an isotope concentration of 500ppm. It decays continuously at 8% per day. After a certain number of weeks it has decayed to an isotope concentration of 285ppm.

How would you solve for the time given this scenario?

A $t = -\frac{1}{7} \cdot \frac{\ln \frac{R}{R_0}}{r}$	B $t = -7 \cdot \frac{\ln R \cdot R_0}{r}$
C $t = -\frac{1}{7} \cdot \frac{r}{\ln \frac{R}{R_0}}$	D $t = -7 \cdot \frac{\ln \frac{R}{R_0}}{r}$