Name ____________________

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

1

A toxin starts at a concentration of 700mg/L. It declines continuously at 5% per hour. After 9 days it has decreased to a certain concentration.

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

A $C = C_0 \cdot e^{\left(\frac{-r}{t\cdot 24}\right)}$	B $C = C_0 \cdot e^{(-r\cdot t\cdot 24)}$
C $C = C_0 - e^{\left(-r\cdot \frac{t}{24}\right)}$	

2

A radioactive material starts at an isotope concentration of 800ppm. It decays continuously at 4% per day. After 7 weeks it has decayed to a certain isotope concentration.

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

A $R = R_0 \cdot e^{\left(\frac{-r}{t\cdot 7}\right)}$	B $R = R_0 - e^{\left(-r\cdot \frac{t}{7}\right)}$
C $R = R_0 \cdot e^{(-r\cdot t\cdot 7)}$	

3

A whale population starts at 200. It declines continuously at 6% per year. After 7 quarters it has decreased to a certain population.

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

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

4

A bird population starts at 200. It declines continuously at 7% per year. After 9 quarters it has decreased to a certain population.

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

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

5

A bird population starts at 600. It declines continuously at 3% per quarter. After 9 years it has decreased to a certain population.

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

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

6

A bacteria population starts at 600. It declines continuously at 2% per week. After 7 days it has decreased to a certain population.

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

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

7

A whale population starts at 600. It declines continuously at 7% per quarter. After 3 years it has decreased to a certain population.

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

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

8

A bird population starts at 600. It declines continuously at 9% per quarter. After 2 years it has decreased to a certain population.

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

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