AP Calculus
6.2 Day 2 notes *name*_____*p*___

1. If there is 1.5g of Ra-226 remaining after 1000 years, what was the initial quantity? How much is left after 10,000 years? (The half-life of Ra-226 is 1620 years)

2. Suppose the population of fruit flies is increasing according to exponential growth. There were 100 flies after the 2^{nd} day and 300 flies after the 4^{th} day. How many fruit flies will be present after 6 days?

3. Let *y* represent the temperature (in $^{\circ}$F) of an object in a room whose temperature is kept at a constant 60°. If the object cools from 100° to 90° in 10 minutes, how much longer will it take for its temperature to decrease to 80°?

6.2 Day 2 asssignment

1. *Complete the following table for the radioactive isotope.*

	Isotope	Half-Life (*in years*)	Initial Quantity	Amount after 1000 Years	Amount after 10,000 Years
a)	^{226}Ra	1599	10 g	_____	_____
b)	^{226}Ra	1599	_____	1.5 g	_____
c)	^{226}Ra	1599	_____	_____	0.5 g

2. *Complete the table for a savings account in which interest is compounded continuously.*

	Initial Investment	Annual Rate	Time to Double	Amount after 10 Years
a)	$10,000	6%	_____	_____
b)	$500	_____	_____	$1292.85

3. The population of Cambodia in 2001 was 12.7 million. The expected continuous annual rate of change (k) of the population for the years 2000 through 2010 is 0.018.

a) Find the exponential growth model $P = Ce^{kt}$ for the population by letting $t = 0$ correspond to 2000.

b) Use the model to predict the population of Cambodia in 2015.

c) Is there a relationship between the sign of k and the change in population for Cambodia?

4. The number of bacteria in a culture is increasing according to the law of exponential growth. There are 125 bacteria in the culture after 2 hours and 350 bacteria after 4 hours.

a) Find the initial population.

b) Write an exponential growth model for the bacteria population. Let t represent time.

c) Use the model to determine the number of bacteria after 8 hours.

d) After how many hours will the bacteria count be 25,000?

5. A container of hot liquid is placed in a freezer that is kept at a constant temperature of $20°F$. The initial temperature of the liquid is $160°F$. After 5 minutes, the liquid's temperature is $60°F$. How much longer will it take for its temperature to decrease to $30°F$?