QUIZ 7 - MATH 111 YOUR NAME:

Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

- 1. You initially invest \$ 500 in a savings account that pays a yearly interest rate of 1.5%.
 - (a) Write a formula for an exponential function giving the balance B in your account as a function of the time t since your initial investment. Make sure to explain variables and units.

(b) What monthly interest rate best represents this account? Show your work and round your answer to three decimal places.

(c) Calculate the decade growth factor.

(d) Use your formula to determine how long it will take for the account balance to reach \$1,000.

2. Uranium 239 is an unstable isotope of uranium that decays rapidly. In order to determine the rate of decay, 1 gram of Uranium 239 was placed in a container, and the amount remaining was measured at 1-minute intervals and recorded:

Time in minutes	0	1	2	3	4	5
Grams Remaining	1	0.971	0.943	0.916	0.889	0.863

(a) Show that these are exponential data. What are the initial value, the growth factor and the percentage change per minute?

(b) Find a model for the amount U(t) remaining as a function of time t. Make sure to explain your variables and the units used.

(c) Use functional notation to express the amount remaining after 10 minutes and then calculate its value.

(d) What is the half-life of Unranium 239?