Name: ____________________________

Test2 Version A: Math 1030 Section 6

Read all directions carefully and completely. Answer each question to the best of your ability. It is important to note that the correct answer is only worth one point. So the emphasis will be placed on whether or not you know how to do the problem.

Some useful information that should be helpful

\[ PMT = \frac{P \times (\frac{APR}{N})}{1 - (1 + \frac{APR}{N})^{-NY}} \]

\[ A = PMT \times \left( \frac{(1 + \frac{APR}{N})^{NY} - 1}{\frac{APR}{N}} \right) \]
1. John opens a savings account and starts depositing $300 monthly. If the APR is 13% what is the amount of time for the account to reach $200,000? What would the balance of the account be 27 years after he opened the account?
2. Say that you maxed out a credit card (Loan) with a limit of $100,000. If the card has an APR of 23% and requires monthly payments, how much do you have to pay per month to pay off the credit card in 10 years? Say I maxed out another card with the same APR that still requires monthly payments. If I can pay the card off in 4 years with monthly deposits of $400 what was the limit on the card?
3. You take 500mg of Ibuprofin at 12 noon and you have 40 mg in your system at 7pm. Construct a linear model and an exponential model for this situation. For the exponential model what is the half-life/doubletime, growth/decay rate, and fractional growth/decay rate? Find how much ibuprofin is in your system at 4pm using both models.
4. Say that in your back yard you have an beehive. Say that your dad inherited the hive in 1983 with 1000 bees. If the bee population is growing by 7% each year, write a exponential model(equation) that describes the bee population as a function of time. Utilizing the model find how may bees there are in 1970 and 2005. At what time will the population of the hive be 100,000 bees? Make a graph for the beehive population.
5. Say that Bill is 6 feet tall. Now medical science has created an exact replica of Bill which is 72 feet tall. Say Bill originally wears circular glasses with a radius of 3 inches in each lens, a 4 inch tall top hat with diameter 4 inches, and a belt that is 36 inches long. What will the area of the lenses, the volume of the top hat, and the length of the belt be in each of the replicas of Bill?
6. Consider the shape that is drawn below. What is the area of the shaded part of the picture? What is the area of the unshaded part of the picture? What is the perimeter of the circle, triangle, square, and rectangle added together?
7. Say that you have the following shape made entirely of chocolate. A ball of radius 2in on top of a right circular cylinder with radius .5in and height 4in on top of a cube with side length 5in on top of a rectangular prism with dimensions 6in × 12in × 1in. What is the volume of chocolate in the shape? If you disassembled the shape what would the surface area of all the pieces added together be? Find the Surface Area to Volume ratio of the sphere, cylinder, cube, and prism separately.