Name: _____

Instructor: Taryn Laird

Math 112 Section: 010

Directions: *Show all work, and answer each question that is asked. Explanations should be given in complete sentences. All graphs should be drawn accurately on this sheet, and be fully labeled.*

1. Charla would like to save $18,000 for a down payment for her first house. She currently has $12,000. At what interest rate, compounded annually, would she need to invest her money in order to have the required $18,000 in 5 years?

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2. A city's population has been growing exponentially over the past several years. In 2010, the population was 130,000 people. In the year 2016, it was 160,000 people.

   Express the population as a function of the number of years since 2010.

   What is the predicted population in the year 2020?

3. A cup of Italian roast coffee contains approximately 190 mg of caffeine. The half-life of caffeine is 6 hours.

    Determine a function to represent the amount of caffeine in your bloodstream after drinking a cup of coffee, as a function of the number of hours.

    If you had a cup of coffee at 5:00 pm, how much caffeine will remain in your bloodstream at 10:00 pm?

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4. A car with an initial value of $40,000 depreciates exponentially. The value of the car after 4 years is estimated to be $26,000.

Write an exponential function to model the value of the car after t years.

What does your model predict the value of the car to be after 10 years?