Precalculus Unit 4: Application Review

1. You are investing $10,000 at 5.4% interest that is being compounded quarterly. How much money will you have after 12 years?

2. You wish to have $20,000 10 years from now. If you are investing at 7% compounded monthly, how much money should you invest now?

3. If you are investing money that is compounded continuously at 6.5%, how long will it take for your money to double?

4. The voltage of a certain conductor decreases over time according to the law of uninhibited decay. If the initial voltage is 40 volts, and 2 seconds later it is 10 volts, what is the voltage after 5 seconds?

5. The population of a colony of mosquitoes obeys the law of uninhibited growth. If there are 1000 mosquitoes initially and there are 1800 after 1 day, what is the size of the colony after 3 days? How long is it until there are 10,000 mosquitoes?

6. The logistic model $W(t) = \frac{14,656.248}{1+0.059e^{0.057t}}$ represents the number of farm workers in the United States t years after 1910 (based on data obtained from the U.S. Department of Agriculture).

Find the number of farm workers in 1910.

How many farm workers were there in 1990 according to the model?

How many farm workers are there in 2012 according to the model?

When did the number of farm workers in the U.S. reach 10,000?

What is the maximum number of farm workers in the U.S. according to this model?