1. A new car depreciates in value at an annual rate of 8%. If the initial value of the car is \$20,000, which of the following functions f models the value of the car, in dollars, t years later?

A) $f(t)=20{,}000(0.92)^t$

B) $f(t)=20{,}000(0.08)^t$

C) $f(t)=0.92(20{,}000)^t$

D) $f(t)=0.08(20{,}000)^t$

2. A researcher is collecting data on a city's population and estimates that the population increases by 5% every 10 years. If the current population of the city is 650,000, which of the following expressions represents the city's population n years from now?

A) $650{,}000(0.05)^{\frac{n}{10}}$

B) $650{,}000(1.05)^{\frac{n}{10}}$

C) $650{,}000(1.05)^{10n}$

D) $650{,}000(0.95)^{n}$

3. George is looking into different types of savings account plans. Which of the following types of options would make George's savings grow exponentially?

A) Every year, 1% of the initial savings is added to the value of the account.
B) Every year, 2.5% of the initial savings is added to the value of the account.
C) Every year, 2.5% of the current savings is added to the value of the account.
D) Every month, \$250 is added to the value of the account.

4.

Time (weeks)	Number of mice
0	10
1	30
2	90
3	270

The table above gives the initial number (at time $t=0$) of mice in a laboratory and the number of mice as breeding occurs for 3 weeks. Which of the following functions f models the number of mice after t weeks?

A) $f(t)=30t$

B) $f(t)=10+30t$

C) $f(t)=10(3^t)$

D) $f(t)=3(10^t)$

5. $500\left(1+\frac{m}{200}\right)^2$

The expression above shows the sum of money in a bank account with an initial deposit of \$500 that pays an interest rate of m compounded semiannually. Which of the following expressions shows how much more money an interest rate of 3.5% makes than an interest rate of 2%

A) $500\left(1+\frac{3.5-2}{200}\right)^2$

B) $500\left(1+\frac{3.5+2}{200}\right)^2$

C) $500\left(1+\frac{3.5}{200}\right)^2-500\left(1+\frac{2}{200}\right)^2$

D) $\frac{500\left(1+\frac{3.5}{200}\right)^2}{500\left(1+\frac{2}{200}\right)^2}$

6. The following table represents the value of a cryptocurrency over 4 days.

Time (days)	Value (dollars)
0	32.00
1	16.00
2	8.00
3	4.00
4	2.00

Which of the following describes the relationship between the number of days passed and the estimated value of the cryptocurrency over the 4 days?

A) Exponential growth
B) Exponential decay
C) Linear growth
D) Linear decay

Questions 7 and 8 refer to the following information. Monica takes out a loan to pay for her new house. The bank charges 5% interest compounded annually. Her initial loan was $100,000 and uses the expression $100{,}000(a)^b$ to find the amount she owes the bank after b years.

7. What is the value of a in the expression?
A) 1.05
B) 0.05
C) 0.95
D) 5

8. A new bank opens up near Monica and only charges 4% interest on loans. How much money (to the nearest dollar) after 5 years would Monica save if she took a loan from the new bank?
A) $105101
B) $5963
C) $4564
D) $1276