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2.1 Exponential Growth: Compound Interest Homework

Solve each of these

1. Write a formula for an exponential function with initial value of 2,500 and a growth factor of

   a) 1.25 b) 1.05 c) 1.18

2. Write a formula for an exponential function with initial value of 4,000 and a growth factor of

   a) 2.5 b) 3.05 c) 4.1

3. Write a formula for an exponential function with initial value of 100 and growth rate (every time period) of

   a) 2.5% b) 3.1% c) 100%

4. Write a formula for an exponential function with initial value of 5,000 and growth rate (every time period) of

   a) 5% b) 8% c) 200%

5. How much money would be in an account after 20 years if you deposited $15,000 at each of the following interest rates compounded annually?

   a) 1.2% b) 28%
   c) 6.56% d) 4.75%

6. How much money would be in an account after 15 years if you deposited $2,500 at each of the following interest rates compounded quarterly?

   a) 2.1% b) 8.2%
   c) 6.5% d) 5.74%

7. How much money would be in an account after 20 years if you deposited $3,000 in a mutual fund which compounds interests 2.2%

   a) annually
   b) semi-annually
   c) quarterly
   d) monthly
   e) daily

8. How much money would be in an account after 2 and a half years if you deposited $25,000 in a mutual fund which compounds interests 1.1%

   a) annually
   b) semi-annually
   c) quarterly
   d) monthly
   e) daily

9. Zach is beginning high school and has $5000 in his savings account. How much more does he need to add to the $5000 so that a CD paying 5% compounded monthly returns $10,000 when he finishes college in 8 years?

10. Find the effective annual yield for an account that gives 2.75% nominal interest compounded semi-annually.

11. Find the effective annual yield for an account that gives 9% nominal interest compounded daily.

12. Suppose you deposit $1000 into an account that compounds interest 4% every 6 months. Write a formula for an exponential function representing this scenario if

    a) t represents time in years of the investment.

    b) t represents the number of 6 month periods of time of the investment.

13. The black squirrel population in Kent has increased from 1000 to 3000 in the last 10 years and is growing exponentially. What is the yearly rate of increase?

14. Suppose you deposit $5000 into an account that compounds interest 6% every year. Write a formula for an exponential function representing this scenario if

    a) t represents time in years of the investment.

    b) t represents the number of 6 month periods of time of the investment.

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✔ 2.1 Checkpoint Exponential Functions 1

1. Write an exponential function with an initial value of $50,000 and a growth rate of 8%.

2. Write an exponential function with an initial value of $1,000 and a growth rate of 4%.

3. How much money would you have after 4 years if you invested $3,000 in a Certificate of Deposit (CD) earning 5.5% interest compounded every year?

4. How much money would you have after 40 years if you invested $1,000 in a mutual fund earning 8% interest compounded every year?

5. Explain **why** in the formula $A(t) = C \times 2^t$ the constant C represents the initial amount of your quantity, given that the variable t represents time.

6. Are the following exponential functions? Yes or no and **why**. For those that are exponential functions, identify the initial amount and the growth rate.

   a) $y = 10(2)^n$

   b) $y = 5n^2$

   c) $y = (n)^{.5}$

   d) $y = .1(1.02)^n$

   e) $y = 300(1.75)^n$

   f) $y = n^5$

   g) $y = -5n + 1$

   h) $y = 10(2)^n$

7. For each of the following growth rates, name the growth factor.

   a) 5%

   b) 7.5%

   c) 42%

   d) 100%

   e) 200%

   f) 150%

8. For each of the following growth factors, name the growth rate.

   a) 1.06

   b) 1.15

   c) 1.50

   d) 5.00

   e) 2.00

   f) 3.5