Practice 29

Applications of Exponential Equations

Solve the problem.

1) Find out how long it takes a $3,500 investment to double if it is invested at 7% compounded semiannually. Round to the nearest tenth of a year. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$. 1) _____

A) 10.5 years B) 10.1 years C) 10.3 years D) 9.9 years

2) The formula $A = 179e^{0.032t}$ models the population of a particular city, in thousands, t years after 1998. When will the population of the city reach 224 thousand? 2) _____

A) 2008 B) 2006 C) 2007 D) 2005

3) The pH of a solution ranges from 0 to 14. An acid has a pH less than 7. Pure water is neutral and has a pH of 7. The pH of a solution is given by pH = - log x where x represents the concentration of the hydrogen ions in the solution in moles per liter. Find the hydrogen ion concentration if the pH = 9. 3) _____

A) 0.11 B) 2.2 C) 10^{-9} D) 10^{9}

4) Find out how long it takes a $2,800 investment to earn $300 interest if it is invested at 7% compounded quarterly. Round to the nearest tenth of a year. Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$. 4) _____

A) 1.7 years B) 1.9 years C) 1.5 years D) 1.3 years

5) Cindy will require $14,000 in 5 years to return to college to get an MBA degree. How much money should she ask her parents for now so that, if she invests it at 11% compounded continuously, she will have enough for school? (Round your answer to the nearest dollar.) 5) _____

A) $24,266 B) $4,660 C) $8,308 D) $8,077

6) Larry has $2,700 to invest and needs $3,200 in 14 years. What annual rate of return will he need to get in order to accomplish his goal, if interest is compounded continuously? (Round your answer to two decimals.) 6) _____

A) 2.41% B) 1.21% C) 3.41% D) 1.41%

7) The population in a particular country is growing at the rate of 1.3% per year. If 5,092,000 people lived there in 1999, how many will there be in the year 2,003? Use $y = y_0e^{0.013t}$ and round to the nearest ten-thousand. 7) _____

A) 5,360,000 B) 6,440,000 C) 5,260,000 D) 5,900,000

8) The population of a certain country is growing at a rate of 1.3% per year. How long will it take for this country's population to double? Use the formula $t = \frac{\ln 2}{k}$, which gives the time, t, for a population with growth rate k, to double. (Round to the nearest whole year.) 8) _____

A) 54 years B) 52 years C) 53 years D) 55 years

1) B
2) D
3) C
4) C
5) D
6) B
7) A
8) C