Honors Algebra II Chapter 7 Word Problems

1. Suzy's grandmother put $1800 in the bank for her when she was born. The bank pays 3% annual interest. How much will be in the account on her 16th birthday?

$A = 1800(1.03)^{16}$ $A = \$2888.47$

2. Suzy was doing an experiment designed to monitor the growth of a particular type of bacteria. She discovered that the bacteria grows at a rate of 23% per day. If she started out with 2,000, how many will there be in 3 weeks?

$A = 2{,}000(1.23)^{21}$ $A = 154{,}539$

3. Maggie won the lottery ($100,00). She put her money in an account that pays 6% annual interest compounded monthly. How much will be in the account in 9 years?

$A = 100{,}000\left(1 + \frac{.06}{12}\right)^{108}$ $A = \$171{,}369.95$

4. Sally inherited $20,000 from her aunt. She put it in an account that pays 4.5% annual interest compounded continuously. How much will be in the account after 12 years?

$A = 20{,}000e^{.045 \cdot 12}$ $A = \$34{,}320.14$

5. Suzy bought a piece of machinery for her burrito shop for $12,000. It depreciates at a rate of 13% annually. What will it be worth after 6 years?

$A = 12{,}000(.87)^{6}$ $A = \$5{,}203.51$

6. Suzy deposited some money into an account that paid 5% compounded continuously. After 8 years there was $29,836.49 in the account. How much did she originally deposit?

$29,836.49 = P e^{.05 \cdot 8}$

$29,836.49 = P(1.491824698)$

$19\,999.997 = P$

$P = \$20,000$

7. Suzy bought a car on her 16th birthday for $15,000. It depreciates at an annual rate of 11%. How long did she have it if it was worth $6,635 when she sold it?

$6,635 = 15,000(.89)^t$

$.442333 = (.89)^t$

$\log_{.89} .442333 = \log_{.89} .89^t$

$t = 6.9996$

$T = 7$ yrs

8. Suzy put $800 in an account that pays 8% compounded quarterly. When she decides to withdraw it, the balance is $2069.66. How long was the money in the account?

$\$2069.66 = 800\left(1 + \frac{.08}{4}\right)^{4t}$

$2.587075 = (1.02)^{4t}$

$\log_{1.02} 2.587075 = \log_{1.02} 1.02^{4t}$

$4t = 48$

$T = 12$ yrs

9. Suzy's godfather, Mick Jagger, put $100,00 into an account the day she was born. The account paid continuous interest. On her 21st birthday the balance in the account was$208,548.20. What interest rate did the account earn (round to the nearest tenth of a percent)?

$208,548.20 = 100,000 e^{21r}$

$2.085482 = e^{21r}$

$\ln 2.085482 = \ln e^{21r}$

$.735 = 21r$

$.035000 = r$

$r = 3.5\%$

10. The population of Suzyville was 132,000 in 2000 when Suzy was elected mayor. Since then the town has grown at a constant rate. If the population in 2009 was 242,677, by what rate did the population grow during that time?

$242,677 = 132,000(1+r)^9$

$1.838462121 = (1+r)^9$

$(1.838462121)^{\frac{1}{9}} = \left[(1+r)^9\right]^{\frac{1}{9}}$

$1.07 = 1 + r$

$.07 = r$

$r = 7\%$