

Word Problem Day Ch7

Name_____

1. (7.1) In 1970, the population of Napa Valley, California, was about 350,000. From 1970 to 2000, the population grew at an average annual rate of about 3.45%. Write an exponential growth model giving the population of Napa Valley t years after 1970. About how many people lived in Napa Valley in 1995? $4 = 350,000 (1 + .0345)^{t}$

817,203

2. (7.1) You deposit \$7500 in an account that pays 3.25% annual interest. Find the balance after 2 years if it is compounded monthly.

P=7500(1+ 0325)12-2 \$8002.99

3. (7.1) The cost of going to the movie theater has increase from \$6 to \$10.50 in the last 7 years. What is the percent increase? 10.5 = 6(1 + 7)

1.75 = (+r)7

2.71=1+5

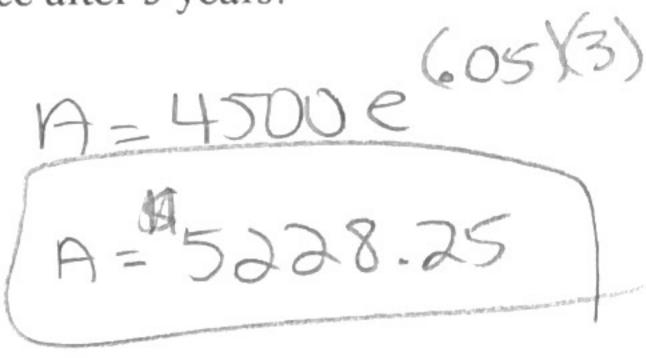
4. (7.2) A new motorcycle cost \$35,000. The value of the motorcycle decreases by 18% each year. Write an exponential decay model giving the motorcycles annual value after t years. Estimate the value after 4 years.

 $y = 35000(1-018)^4$ y = \$515824.26

5. (7.2)You buy a Yadier Molina baseball card for \$50. If the card increases in value at a rate of 15% each year, how much was it initially worth 8 years ago.

 $50 = \alpha(1+.15)$ $50 = \alpha \cdot 3.06$ $\alpha = 16.34$

6. (7.3) You deposit \$4500 in an account that pays 5% annual interest compounded continuously. What is the balance after 3 years?





- 7. (7.4) Once a hurricane reaches land, the wind speed s (in knots) within the hurricane is related to the time t (in hours) the hurricane remains over land. For one particular hurricane, this relationship can be modeled by $y = -57.1 \log t + 121$
 - a.) Graph the model in your graphing calculator and make a sketch.
 - b.) How fast are the wind speeds after the hurricane has been on land for 1 hour?

$$y = -57.11 \log 1 + 121$$
 $y = 121$

- c.) How long after the hurricane reaches land are the wind speeds about 80 knots?
- 8. (7.6) You deposit \$500 in an account that pays 3.25% annual interest compounded monthly. How long does it take for the balance to quadruple?

$$2000 = 500 \left(1 + \frac{0325}{12}\right)^{12t}$$

$$4 = 1.0027^{12t} \log_{1.0027} 4 = 12t$$

$$t = 42.853ps$$

9. (7.6) You deposit \$700 in an account that pays 2.75% annual interest. How long does it take the balance to reach \$2000 when it is compounded continuously?

$$2000 = 700 e^{.0275t}$$

 $2.86 = e^{.0275t}$
 $1 = 38.21$

10. (7.6) You invest \$1000 into an account at 4% interest compounded continuously. How long would it take for your money to double?

$$2000 = 1000 e^{.04t}$$

 $2 = e^{.04t}$
 $1nz = .04t$ $t = 17.33yrs$