

EXAM 3
Math 105
December 12, 2006

Name _____

You must show all your work. Partial credit will be given.

1. The following table shows the amounts spent on reducing sizes of first-grade through third-grade public school classes in a certain state.

Year	Amount (millions)
1988	\$1
1990	\$4
1992	\$14
1994	\$37
1996	\$51
1998	\$66
2000	\$69
2001	\$71

Find a model for this data and explain *why* you chose that particular model. Use your model to predict the amounts spent in 1993 and in 2006. (12 pts)

2. A calculator currently costs \$87. The price of the calculator is expected to rise by \$3 per year. Find a mathematical model for the price of the calculator. (8 pts)

3. Solve each of the following exponential equations. (5 pts each)

(a) $5(0.5)^x = 0.125$

(b) $2(1.09)^t = 3(2.11)^t$

4. A new 2002 Jeep Grand Cherokee Laredo has a manufacturer's suggested retail price (MSRP) of \$25,665. A buyer gets an \$8500 credit for her trade-in and finances the balance of the price at her local bank with a 72-month, 8.99% loan. What is her car payment? (10 pts)

5. The CREF Inflation-Linked Bond Fund has earned an average of 6.88% since May 1, 1997. Assuming that the account will earn an annual rate of 6.88% compounded monthly, what will the future value of an account with a present value of \$2500 be in 20 years if \$300 contributions are made monthly? (Write out the formula needed. You may use TWM to do the solving if you so desire.) (10 pts)
6. Find the average percentage yield for a savings account which pays an annual rate of 3.50% compounded quarterly. (5 pts)
7. An investor has two accounts, one of which is a \$2000 savings account with a simple interest rate of 12% and the other is an account with \$1500 invested at 11.2% compounded monthly. When will these two accounts have the same amount of money? (8 pts)

8. Countrywide Bank offers a five-year CD paying an annual rate of 4.69% interest compounded monthly with a minimum investment of \$1000. How much will the CD be worth at maturity if the minimum amount is invested? (8 pts)
9. A company establishes a sinking fund in order to purchase a large piece of equipment in the future. The company expects to replace the current piece of equipment 5 years from now and anticipates that the cost of replacement will be \$325000. If the company opens an annuity which will pay 5.1% compounded quarterly, what should the company's quarterly payments be in order to reach their goal? (10 pts)

10. The amount of land in U.S. farms may be modeled by $F(t) = 115.1(0.9352)^t + 900$ million acres where t is the number of years since 1978. According to this model in what year will the amount of land in U.S. farms drop below 910 million acres? (9 pts)
11. A 3824-square-foot, six-bedroom, three-bath home in Queen Creek, Arizona, was advertised for \$302,691 in February 2005. A family finances 80% of the purchase price with a 5.75% loan. If the family makes \$1500 payments monthly, how long will it take them to pay of the loan? (10 pts)