PRACTICE EXAM 3 - MATH 111

DATE: Friday, March 19
INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Let $f(x) = 2^{x-3} - 1$. Find the x- and the y-intercepts of f, determine its horizontal asymptote and then use the three-point process to roughly sketch its graph.
2. Find the domain of the logarithmic function $f(x) = \log_{2004} \frac{x-2}{x^2-3x}$.
3. Use the inverse three points process to plot the graph of the logarithmic functions $f(x) = \log_2 (x+4)$ and $g(x) = \log_{\frac{1}{2}} (x+1)$ on the same system of axes.
4. Solve the logarithmic equations
   (a) $\log_2 \sqrt{2y^2} - 1 = \frac{1}{2}$
   (b) $\log_{2004} z = \sqrt{\log_{2004} z}$
5. Your uncle, who has been to college but has not had the chance to take Math 111 with George, comes to you to get some help with his financial plans for retirement. He gives you the following information: 5 years ago, when he was 55 he started paying \$2,000 at the end of every semester in an account yielding interest rate 4%. He is going to stop depositing any more money and to transfer this amount to a bank account that yields 4% compounded quarterly for the next 5 years. He wants your help in trying to determine how much money he should deposit (starting from today) at the beginning of every semester in an annuity with yearly interest rate 2% compounded semiannually for the next 5 years so that the total amount that he has at 65 is \$60,000.
6. Suppose that you deposit P dollars in an account yielding interest rate 5% compounded continuously. Find in how many years your balance will quadruple and what is the effective interest rate of the account.

These financial formulas are offered courtesy of George® for your perusal:

1. $A = A(1 + rt)$
2. $P = A(1 - rt)$
3. $A = P(1 + i)^n$
4. $A = P(1 + \frac{r}{m})^{mt}$
5. $A = Pe^{rt}$
6. $S = R\frac{(1+i)^n - 1}{i}$
7. $S = R\frac{(i+i)^{n+1} - 1}{i} - R$