PRACTICE EXAM 3 - MATH 111

DATE: Friday, March 18

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. Use your basic knowledge of exponentials and your graphing techniques to graph the function $f(x) = 3^{2-x} 1$. (Show clearly all transformations and label all points used.) Then find the domain and the range of f.
- 2. Assembly line operations tend to have a high turnover of employees, forcing the companies involved to spend much time and effort in training new workers. It has been found that a worker new to the operation of a certain task on the assembly line will produce P(t) items on day t, where $P(t) = 25 25e^{-0.3t}$. Find the number of items produced in the first day and the maximum number of items that can be produced.
- 3. Find the domain of the logarithmic function $f(x) = \log_3 \frac{x^2 5x + 6}{x + 1}$.
- 4. Solve the following equations:

(a)
$$2^{x^2-4x} = \frac{1}{16}$$

- (b) $\log x + \log (3x 13) = 1$
- 5. Harv's Meats knows that it must buy a new deboner machine in 4 years. The machine costs \$12,000. In order to accumulate enough money to pay for the machine, Harv decides to deposit a sum of money at the end of each 6 months in an account paying 6% compounded semiannually. How much should each payment be?
- 6. A friend of yours borrows \$1,200 from his dad with simple interest rate 2%. After 2 years he repays the loan and his dad deposits the payment in an account in your friend's name yielding 4% compounded quarterly. If the money stays in that account for 3 years, find how much your friend will have in the account after the entire 5 year period.

These financial formulas are offered courtesy of George:

1.
$$A = Pe^{rt}$$

2. $S = R\frac{(1+i)^n - 1}{i}$

$$3. P = A(1 - rt)$$

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

7.
$$A = P(1 + rt)$$