Math 120 Exam #4 Spring '09	**Show all work** (and answers) on the blank paper provided. Write nothing on this paper other than your name.	**Name:**

1	10	
2	10	
3	10	
4	10	
5	10	
6	10	
7	10	
8a	10	
8b	10	
8c	10	
8d	10	
8e	10	
8f	10	
8g	10	
8h	10	
9	10	
10	10	
11	10	
total	180	
curve		
%		

1) For the quadratic function $f(x) = 4x^2 - 4x + 3$ give the vertex form, the vertex, the axis of symmetry, the domain, and the range.

2) The polynomial function $f(x) = x^4 + 10x^3 + 27x^2 + 10x + 26$ has zero i. Find all other zeros.

3) For $f(x) = 2x^3 - 9x^2 - 6x + 5$, list all possible rational zeros, find all rational zeros, and factor $f(x)$ into linear factors.

4) Find a polynomial function f of degree 3 with real coefficients such that -2, 1, and 4 are zeros and $f(2) = 16$.

5) Find a polynomial function f of least degree having only real coefficients and the zeros $2 - i$ and 5.

6) Find the future value if $32,000 is invested at 6.6% compounded quarterly for 12 years. (Use the formula $A = P(1 + r/m)^{mt}$).

7) Rewrite $10\log_5 a - 7\log_5 c^5$ as a single logarithm with coefficient 1.

8) Solve each equation. For each solution that is irrational round to the nearest thousandth.

a. $2^{6-3x} = 8^{x+1}$

b. $(\sqrt[3]{5})^{-x} = (0.2)^{x+2}$

c. $x = \log_6 \dfrac{1}{216}$

d. $\dfrac{2}{3} = \log_x \sqrt[3]{16}$

e. $1.2(0.7)^x = 0.6$

f. $8^{2x+1} = 10^{1-x}$

g. $\ln x + \ln(3x - 13) = 1$

h. $\log(11x + 9) = 3 + \log(x + 3)$

9) Carbon-14 is a radioactive isotope that decays according to the model $A(t) = A_0 e^{-0.0001216t}$. If the pigment from a cave painting contains 6.7% of the normal amount of carbon-14, how old is the painting?

10) Find the doubling time of an investment earning 3.7% interest if interest is compounded continuously.

11) If 30 grams of a radioactive isotope are present initially and 12 years later 28.7 grams remain, how much of the substance will be present after a century?