NAME:_____   Date: 04/16/2009

MATH 104: Pre-Calculus   Spring 2009   Instructor: Tigran Mkrtchyan   **TEST 3**

YOU MUST SHOW ALL OF YOUR WORK to receive full credit for the problem. The more work you show on your paper leading to your solution will give me more opportunity to award partial credit. Clearly indicate your solution to the problem.

1) Suppose that a baseball is tossed straight up and that its height as a function of time is given by the function $h(t) = -16t^2 + 64t + 6$ where h(t) is measured in feet, t is in seconds.
   (a) *(2 points)* What is the maximum height?
   (b) *(2 points)* After how many seconds will the baseball reach the maximum height?

2) *(4 points)* Sketch the graph of $y = x^3 - 4x^2 - 5x$. You have to show the intercepts.
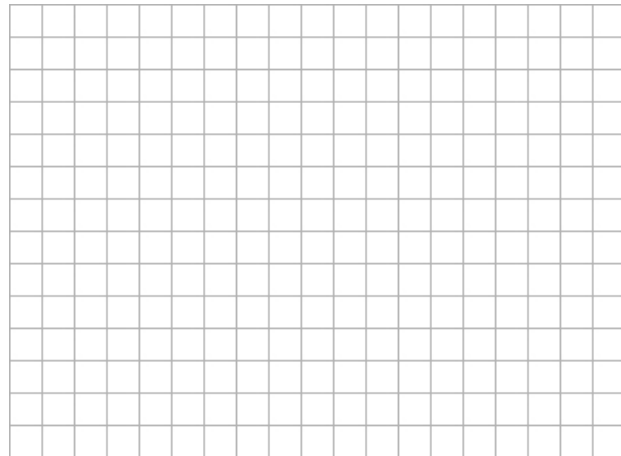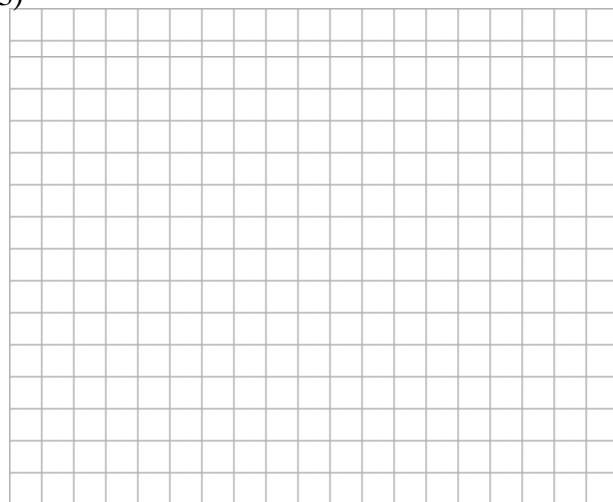

3) *(4 points)* Sketch the graph of $y = \dfrac{x-2}{x+3}$.
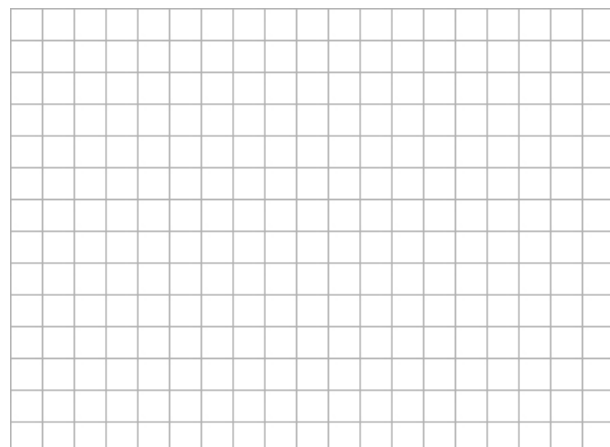
4) (a) *(3 points)* Sketch the graph of $y = -\log_2(x-3)$

    (b) *(1 points)* State the domain.

5) Solve the following equations.

    (a) *(4 points)* $\log_3(6x) = \log_3 6 + \log_3 x$

    (b) *(4 points)* $\log_2(2x^2 + 4) = 5$

    (c) *(4 points)* $10^{2x} + 3(10^x) - 10 = 0$

6) Solve the following inequalities.
   (a) *(4 points)* $\ln(2-5x) > 2$

(b) *(4 points)* $e^{2-3x} \le 1$

7)
(a) *(4 points)* In how many years will $2000 grow to $6000 at interest rate 8% compounded annually?

(b) *(4 points)* In how many years will $2000 grow to $6000 at interest rate 8% compounded continuously?

Extra Credit: *(4 points)* Solve $\dfrac{\ln(\sqrt{x+4}+2)}{\ln\sqrt{x}} = 2$ and find the domain.