Math 31 Sec 7 REPLACEMENT PROBLEMS DUE: 8 October 2003

Name:_____

DIRECTIONS

1) Print your name above.

2) You may use a calculator (except symbolic manipulators such as a TI-89, TI-92, or similar), but your answers must be given in their ***exact*** form. (i.e. $\sqrt{3}$ and not 1.73, π and not 3.14)

3) All work must be shown on this assignment. ***No credit will be given for a correct answer without supporting work that leads to the answer***. When it is indicated that calculators are not to be used, clear non-calculator work must be shown.

4) For this assignment, you may use your book, your notes, the Math Help Center, or talk to me. You should follow the guidelines for homework assignments regarding discussing these problems with fellow classmates.

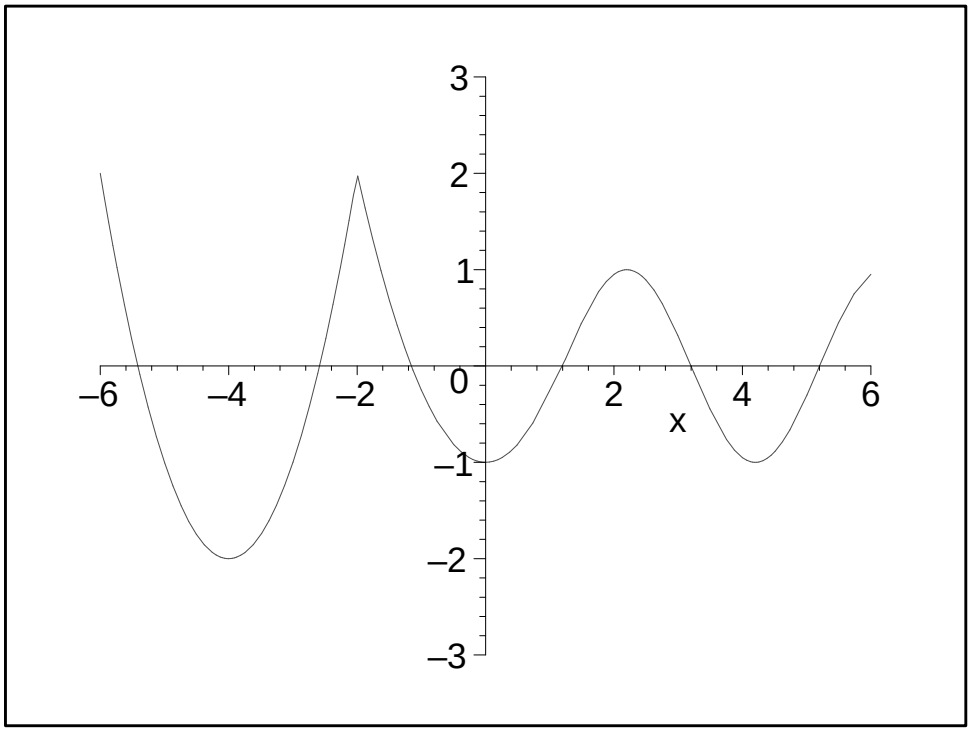
5) Place a box around ***all*** of your final answers. Include units when necessary.

6) This assignment will be graded out of 10 points; each problem is worth two points and **there will be *very little* partial credit**. Should you score a 9 or 10, you will receive 50% of your points missed on Exam I back. Should you score a 7 or 8, you will receive 25% of your points missed on Exam I back. Should you score below 7, your score on Exam I will be unchanged.

1. Evaluate the following limit: $\lim_{\theta \to 0} \dfrac{\cot(5\theta)\sin(\pi\theta)}{cos(7\theta)}$

2. Algebraically (not graphically), determine and write equations for all of the asymptotes (both horizontal and vertical) of the graph of $f(x) = \dfrac{(x-3)(2x^2-1)}{(x^2-9)\sqrt{4x^2+3}}$

3. Consider the graph of $f(x)$ given below:



(a) For what values of x is $f(x)$ discontinuous?

(b) For what values of x is $f(x)$ not differentiable?

(c) For what values of x is $f'(x) = 0$?

4. By using the Intermediate Value Theorem, explain why there is a solution to the equation $4x^4 - 3x^2 + 2x - 5 = 3$ on the interval $[0, 2]$.

5. A ball is rolling down a 2 foot long hill so that its distance from the top of the hill after t seconds is given by $s(t) = \dfrac{4t}{t^2+1}$ feet.

(a) How long does it take for the ball to roll halfway down the hill (s(t)=1)? (Hint: Since $s(1) = 2$, the ball hits the bottom after 1 second, so your answer should be between 0 and 1.)

(b) How fast is the ball moving at this time?