ASSIGNMENT 4

Dawson College
Course Code: 201-NYA-05 S07
DUE DATE: Friday March 25th 2010
Instructor: E. Richer

Section 23.9 Find the second derivative of each of the given functions.
12. $y = 6x - 2x^5$
14. $r = 3\theta^2 - \frac{1}{2\sqrt{\theta}}$
16. $f(x) = \sqrt[3]{6x+5}$
26. $y = \frac{x}{\sqrt{2x}}$
30. $xy = y^2 + 2e^3$

Section 27.1
44. If $y = \cos 2x$ show that $y'' = -4y$

Section 27.5
47. Find the derivative of $y = x^x$ by first taking logarithms of each side of the equation.
48. Find the derivative of $y = (\sin x)^x$ by first taking logarithms of each side of the equation.

56. The electric potential V at a point P at a distance x from an electric charge distributed along a wire of length $2a$ is $V = k \ln \frac{\sqrt{a^2+x^2}+a}{\sqrt{a^2+x^2}-a}$, where k is a constant. Find the expression for the electric field E, which is defined as $E = -V'(x)$.

Section 24.5
For the following exercises find those values of x for which the given functions are increasing and those values of x for which they are decreasing.
6. $y = 2 + 6x - 3x^2$
8. $y = x^4 - 6x^2$

For the following exercises find the values of x for which the given function is concave up, the values of x for which it is concave down, and any points of inflection.
14. $y = 2 + 6x - 3x^2$
16. $y = x^4 - 6x^2$

Sketch the graphs of the given functions by determining the appropriate information and points from the first and second derivatives.
24. $y = x^3 - 9x^2 + 15x + 1$
26. $y = x^3 - 12x + 12$
28. $y = x(x-4)^3$