Math 1100 Lesson # 4 **Name:**_____

Directions:Work all problems in the assignment. If you need more room use the back of the page to complete the problem.

Section 2.5

Problem 22. Use the General Power Rule to find the derivative of the function.

$h(x) = (4x - x^2)^3$

Problem 32. Use the General Power Rule to find the derivative of the function.

$$f(x) = (25 + x^2)^{-1/2}$$

Problem 50. Compute the derivative of the function.

$$f(x) = \frac{1}{\sqrt{x+2}}$$

Problem 56. Compute the derivative of the function.

$$y = t\sqrt{t+1}$$

Problem 66. Find an equation of the tangent line to the following function at the given point.

$$s(x) = \frac{1}{x^2 - 3x + 4} \qquad (3, \frac{1}{2})$$

Problem 74. **Depreciation** The value V of a machine t years after it is purchased is inversely proportional to the square root of $t+1$. The initial value of the machine is \$10,000.

(a.) Write V as a function of t.

(b.) Find the rate of depreciation when $t = 1$.

(c.) Find the rate of depreciation when $t = 3$.

Section 2.6

Problem 24. Find the given value.

$$f(t) = \sqrt{2t+3} \qquad f'''(1/2)$$

Problem 30. Find the higher order derivative from the given derivative.

$f'''(x) = 2\sqrt{x-1}$ $\qquad$ $f^{(4)}(x)$

Problem 34. Find the second derivative of the following function and solve the equation $f''(x) = 0$.

$f(x) = 3x^3 - 9x + 1$

Problem 43. **Velocity and Acceleration** The velocity (in feet per second) of and automobile starting from rest is modeled by

$$\frac{ds}{dt} = \frac{90t}{t+10}$$

Create a table showing the velocity and acceleration at 10 second intervals during the first minute of travel? What can you conclude?

Problem 44. **Stopping Distance:** A car is traveling at a rate of 66 feet per second (45 miles per hour) when the breaks are applied. The position function for the car is given by $s = -8,25t^2 + 66t$ where s is measured in feet and t is measured in seconds. Create a second by second table showing the position, velocity, and acceleration for each value of t until the car stops. What can you conclude?

Student ID: _____

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Lesson Number: 4

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Date: _____

Grade: _____

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