MTH 151
Quiz 4
Spring 2010

Show all work in a neat and organized fashion. Clearly indicate your answers.
20 points possible.

1. (7 pts.) A particle moves in a straight line according to a law of motion

$$s = f(t) = t^3 - 12t^2 + 45,$$

$t \geq 0$, where t is measured in seconds and s in feet.

(a) Find the velocity at time t.

(b) What is the velocity after 3 seconds?

(c) When is the particle at rest?

(d) When is the particle moving in the positive direction?

(e) Find the total distance traveled during the first 8 seconds.

(f) Find the acceleration at time t.

2. (7 pts.) Find dy/dx by implicit differentiation.

$$x^4(x + y) = y^2(3x - y)$$

3. (7 pts.) A street light is mounted at the top of a 20-ft-tall pole. A woman 6 ft tall walks away from the pole with a speed of 4 ft/sec along a straight path. How fast is the tip of her shadow moving when she is 55 ft from the pole?