MTH 151
Quiz 3
Fall 2011

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

1. (9 pts.) Differentiate each function. You do not have to simplify your answers.

(a) $y = \dfrac{1+3x}{x^5 - x^2}$

(b) $H(x) = \cos x + \sin x + \sec x$

(c) $w(\theta) = \tan 3\theta$

2. (3 pts.) If $f(x) = \sqrt{x}\, g(x)$, where $g(4) = 12$ and $g'(4) = 11$, find $f'(4)$.

3. (3 pts.) Find dy/dx by implicit differentiation.

$$x^2 + xy - y^2 = 16$$

4. (5 pts.) A particle moves according to a law of motion $s = f(t)$, $t \geq 0$, where t is measured in seconds and s in feet.

$$f(t) = 2t^3 - 30t^2 + 50t$$

(a) What is the velocity after 2 seconds?

(b) When $t = 2$, is the particle moving in the positive direction, the negative direction, or neither?

(c) When $t = 2$, is the particle speeding up, slowing down, or neither?