Math 124 Worksheet #5
May 11, 2007

1. Find all of the points of the graph $3x^2 + 4y^2 + 3xy = 26$ where the tangent line is horizontal. (Hint: After differentiating, plug in $\frac{dy}{dx} = 0$ to simplify your expression.)

2. Find the 20th derivative of $\ln x$. (Note: An alternative notation for the 20th derivative of $\ln x$ is $D^{20} \ln x$.)

3. $\frac{d}{dx}(\ln(xe^x) + 8) = ?$

4. If $f(t) = (\tan t)^{2t}$, what is the equation of the tangent line of f at the point $(\frac{\pi}{4}, 1)$?

5. A golf cart has the position $s = f(t) = 2\arctan t$ (in miles) at a time t (in hour). When is the cart speeding up? When is the cart slowing down?

6. For the following graph of f, sketch f' and f''.