MATH 1550 - Calculus I - Section 1
Summer 2013

HOMEWORK 3

Due at the beginning of class, Friday, June 28th

Read the questions carefully. You must *show your work* to get full credit.

(1) Let $f(x) = \sqrt{e^x \sin x}$ and find $f'(x)$.

(2) Let $f(x) = \dfrac{2x^2 - 6}{\cos(3x)}$ and find $f'(x)$.

(3) Let $f(x) = 8^{3^x}$ and find $f'(x)$.

(4) Given $5^y + 4y^3 - \sec x + 3^x = 0$, find $\dfrac{dy}{dx}$.

(5) Given $e^x \tan y + 5x = y$, find $\dfrac{dy}{dx}$.

(6) A hammer thrower spins the hammer counterclockwise in a circle tracing the graph of $x^2 + y^2 = 1$. When the hammer is released at any point, it travels along the tangent line to the circle at that point, as shown below. Find the x-coordinate of the point where the hammer should be released so that it travels towards the point $(50, 0)$.
Think about the following: How do we find the equation of a tangent line to the circle? Is there a general formula that gives the equation of the tangent line to the circle at any point?