Math 141 Honors Problems #4
Due date: Tuesday, 9/15/09

HP7 [3 points] Let $f(x) = p(x)/q(x)$ be a rational function, where $p(x)$ and $q(x)$ are polynomials. When does $f(x)$ have a *diagonal* asymptote? If indeed it does have a diagonal asymptote, how can you find its equation from the formula for $f(x)$?

HP8 [4 points] Prove that every polynomial function $f(x)$ of odd degree has at least one real root.

("Prove" means "give a logical step-by-step argument, with every step justified either by algebra or by citing an appropriate theorem". Your argument should apply to all polynomial functions of odd degree. That is, it is not enough to give an *example* of an odd-degree polynomial and verify that it has a root.)