

Quiz 5 - Math 53
October 2, 2008

Name _____

1)[4pts] Prove that $\lim_{(x,y) \rightarrow (0,0)} \frac{x^3 - y^3}{\sqrt{x^2 + y^2 + 4} - 2} = 0$. (Hint: use the conjugation trick and then switch to polar coordinates.)

2)[5pts] The ideal gas law says that $P = \frac{xt}{v}$, where P is pressure, x is the number of gas molecules, t is temperature, and v is volume (all measured in appropriate units). Suppose you've measured $x = 10$, $t = 200$, and $v = 1$, with each measurement accurate to within 1%. What should the value of P be? Using linear approximation, estimate the **maximum** possible error in P . (Hint: to estimate maximum possible error, you may have to assume your errors for x , t , v have different signs. For example, take $\Delta v = .01$ or $\Delta v = -.01$, whichever makes ΔP bigger.)