Name: _____

Quiz 5

Math 111

You have 20 minutes to complete **both sides** of this quiz. When you're finished, first check your work if there is time remaining, then turn it in. You may use a scientific calculator, but not a graphing one. **Show all your work.**

1. (8 points) One of the two functions below is a polynomial, and one is not. For each of the two, determine if it is a polynomial, **explaining your reasoning**, and if it is a polynomial, find its behavior as $x \longrightarrow \infty$ and as $x \longrightarrow -\infty$.

a) $f(x) = x^7 + x^2 - x + x^{-1}$.

b) $g(x) = 2x + .56x^5 - x^3$.

2. (16 points) Consider the rational function $H(T) = \dfrac{T}{T^2 - 1}$.

a) What is the domain of H?

b) What is the behavior of H as $T \longrightarrow \infty$ and as $T \longrightarrow -\infty$?

c) Find $H(1.1)$, $H(1.01)$, and $H(1.001)$. If you have a calculator, find them exactly, and if you don't, write them as fractions and get a sense of how big or small they are. Then use your answers to predict the behavior of H as $T \longrightarrow 1$ with $T > 1$.

$H(1.1) =$

$H(1.01) =$

$H(1.001) =$

As $T \longrightarrow 1$ with $T > 1$, $H(T) \longrightarrow$

d) Use a similar process to predict the behavior of H as $T \longrightarrow 1$ with $T < 1$.