.1. Find the equation of a tangent line to the point (1, 1) on the quartic y = x^4. Show work.

2. Consider the graph of f(x) = (x^2 + 2x) / (x^3 – 9x).

a. Considering the reals, find the domain for this function f algebraically. Use the calculator only to check your findings.

b. Find where all vertical asymptotes exist and use limits to describe why they exist.

3. Calculate the following limits. Show algebraic method of calculation. Use the calculator only to check your calculations.

a. Find the limit of f(x) = x^2 – 1 as x approaches +1.

b. Find the limit of f(x) = (x^2 – 1)/ (x - 1) as x approaches 1..

c. Find the limit of f(x) = (x - 1) / (x^2 – 1) as x approaches 1.

4. Calculate the following limits. Show algebraic method of calculation. Use the calculator only to check your calculations.

a. Find the limit of f(x) = (3x + 2)/(7x -3) when x approaches ∞.

b. Find the limit of f(x) = (3x^2 + 2) / (7x^3 – 3) whne x approaches ∞.

c. Find the limit of f(x) = (3x^3 + 2) / (7x^2 – 3) when x approaches.∞.

5. Johnny is claiming that he has a function that is continuous at the point where x = 2.

This ensures three things are true as we consider the graph on the interval

1 < x < 3. Explain these three results we know if his claim is true.

6. Consider f(x) is defined piecewise as f(x) = - x^4 + 3 when x ≤ 2 and f(x) = x^2 + 9

for x > 2.

a. Show this function is continuous for x < 2.

b. Show this function is continuous for x > 2.

c. Show this function is continuous at x = 2.