

## The 2nd Quiz of Calculus 0319

1. (20%) Find an equation of the tangent line of  $3(x^2 + y^2)^2 = 100xy$  at the point  $(3,1)$ .

2. (40%) Sketch the graph of  $f(x) = -3x^5 + 5x^3$  and find the critical numbers, the points of inflections, and the relative extrema.

3. (40 %) True or False ? If it is true, explain why. If it is false, give a counterexample.

- (1). If the coefficients of polynomial function are all positive, then the polynomial has no positive zeros.
- (2). If a polynomial function has three  $x$ -intercepts, then it must have at least two points at which its tangent line is horizontal.
- (3). There is a relative maximum or minimum at each critical number.
- (4). If  $f''(2) = 0$ , then the graph of  $f(x)$  must have a point of inflection at  $x = 2$ .