Quiz 2

 $\begin{array}{ll} \star \mbox{ Answer and mark clearly the questions in the provided answer sheets.} \\ \mbox{Write down your name and student's ID on the each answer sheet you used.} \\ \star \mbox{ Note: No points will be given if no arguments are provided for an answer.} \\ \mbox{ Good Luck!} & \sim \sim Yuling \\ \end{array}$

1. (10 points) Find the point(s), if any, at which the graph of

$$f(x) = \frac{x^2}{x - 1}$$

has a horizontal tangent line.

- 2. (30 points) Find an equation of the tangent line to the given graph at the given point. (a) $f(t) = (t^2 - 9)\sqrt{t+2}$; at (-1, -8) (b) $f(x) = \frac{x+1}{\sqrt{2x-3}}$; at (2, 3)(c) $\sqrt{xy} = x - 2y$; at (4, 1)
- 3. (20 points) (a) Find $\frac{dy}{dx}$, $y = 2\tan^2(4x)$ (b) Find f''(1), $f(x) = (x^3 2x)^3$
- 4. (20 points) Find all relative extrema and points of inflection of (a) $g(x) = (x+2)(x+5)^2$ (b) $f(x) = \frac{4}{1+x^2}$
- 5. (10 points) You are given $f'(x) = -x^2 + 2x 1$. Find the intervals on which (a) f'(x) is increasing or decreasing, (b) the graph of f is concave upward or concave downward, and (c) find the x-values of the relative extrema and inflection points of f.
- 6. (10 points) Find the absolute extrema of

$$f(x) = \frac{x}{x^2 + 1}$$

on the closed interval [0, 2].