Calculus with Precalculus I (12011 Section 02)
Exam 1.
Instructor: Prof. Artem Zvavitch
There are 7 problems, all together 110pts the maximal grade is 100pts. GOOD LUCK

Problem 1. (10pts) *Simplify*

$$\frac{(zx^{\frac{2}{3}})^{-3}}{(\sqrt{z^6}y^{-3})^{\frac{1}{3}}}.$$

Problem 2. (15pts) *Find the domain of function*

$$f(x) = \frac{1}{\sqrt{x^2-3x}} + \sqrt{x-2}.$$

Problem 3. (15pts) *Find an equation of the line through point* $(1, -2)$ *and perpendicular to the line* $3x - 2y = 2$.

Problem 4. (20pts) *Find maximum or minimum of the following function*

$$f(x) = -2x^2 + 4x + 6.$$

Also find x*-intercepts and* y*-intercepts and sketch the graph of this function.*

Problem 5. (15pts) *Solve*

$$(x-6)(x^8-2x^4-3)=0.$$

Problem 6. (20pts) *Simplify*

$$\frac{1}{x^2-1}-\frac{1-x}{x^2-2x-3}-\frac{x+1}{x-3}.$$

Problem 7. (15pts) *Give a definition of decreasing function. Show that* $f(x) = x^2 - 2x - 3$. *is not decreasing function on the interval* $[-2, 3]$. *Find the average rate of change of this function on the interval* $[-1, 1]$.