MATH 100 – MIDTERM 2

Name _____ **Student Number** _____

NOTE. In all parts reasons must be given. Answers that don't show any reasoning will get no marks.

Marks:

1] _____

2] _____

3] _____

4] _____

5] _____

Total _____

1] (8 marks) Find the inverse of the following. Write down the domain of the inverse.

a] $y = x^3 + 1$

b] $y = \frac{x-1}{x+2}$

2] (8 marks) Find the fixed points of the following functions. Show graphically whether they are repelling or attracting.

a] $f(x) = 2x - 5$

b] $f(x) = x/3 - 9$

3] (8 marks)

a] Suppose f(3)=3, f(9)=18, f(4)=9. What is $f^{-1}(18)$? What is $f(f(4))$? What is $f(f^{-1}(4))$?

b] If $f(x) = \frac{x-4}{x+5}$ and $g(x) = \frac{x-7}{x+8}$ are f and g inverses to each other?

c] With f and g as in part b] compute $f(g(5) + 1)$.

d] What is the maximum (or minimum) of $y = x^2 - 4x + 2$?

4] (8 marks) Find the the maximum possible area for a rectangle inscibed in a circle of radius 3. (Hint: maximize the square of the area.)

5] (8 marks) Sketch the graph of $y = x/[(x+1)(x-3)]$. Specify the intercepts and the asymptotes.