Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 101- Q2 Date: 19-10-2014

SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERS NOT SUPPORTED BY WORK.

Problem 1: (24 points)

(i) Find all points of discontinuity of the function $y = \dfrac{\sin x}{|x|}$ and *identify the type of discontinuity.*

(ii) Find the limit if it exists $\lim\limits_{x \to 0} \dfrac{\sin(2\sin x)}{\sin 2x}$.

(iii) Use the Intermediate Value Theorem to prove that the equation $\sqrt{x+3} = 2 - x$ has a solution. (**DO NOT FIND IT**)

Problem 3: (16 points) Find all asymptotes of each of the following functions (if any exists).

(i) $f(x) = \dfrac{\sqrt{x^2+1}}{x}$

(ii) $g(x) = x + 2 + \dfrac{3}{x^2-1}$