MATA31 TUT000

**Quiz 2 on (A3 & A 4)** **Mark:**_____/25

**Last Name:**_____ **First Name:**_____ **Student #:**_____

1. [ 3 points] Use the Geometric Definition of Limit to write a Formal ( $\delta$, $\varepsilon$, $M$, $N$ ) statement for $\lim_{x\to 2^-}(4-x^3)=-4$ . Sketch the graph that illustrates the role of constants involved.

2. [ 2 points] Prove Uniqueness of Limits Theorem
   *(or the Theorem that states that limit exists iff left-hand and right-hand limits are equal)*

3. [ 3 points] For the $\lim_{x\to 5}\sqrt{x-1}=2$ find a $\delta$ that works for $\varepsilon=1$.

4. [ 4 points] Give a delta-epsilon proof for each of the following limit statements.
   (I) Write formal (algebraic ) statement
   (II) Establish connection between constants
   (III) Carefully formulate Proof.

a) $\lim_{x\to -6}(x+2) = -4$

b) $\lim_{x\to 5^+}\sqrt{2x-10} = 0$

c) $\lim_{x\to\infty}\frac{2x-1}{x} = 2$

d) $\lim_{x\to 1}(x^2 - 6x + 7) = 2$