

FULL NAME: _____
(BLOCK CAPITALS)

STUDENT NUMBER: _____ TUTORIAL GROUP: _____

4CCM115A Numbers and Functions: Mock Class Test 2

CALCULATORS MAY NOT BE USED

ANSWER GRID: put a cross in ONE BOX for the correct answer for each question. If you change your mind and want to correct your answer, obliterate your incorrect answer by shading its box, and put a new cross in the box for the correct answer.

	a	b	c	d	e
1					
2					
3					
4					

MARKS: each correct answer = +5, incorrect = -1, none (or more than one) = 0.

Do any rough working on the back of this sheet, or on a NAMED separate sheet.

1. Which one of the following sets is NOT bounded above?

- (a) $\bigcap_{n=1}^{\infty} (0, \exp((-1)^n n))$ (b) $\bigcup_{n=1}^{\infty} (0, \exp(-n))$
(c) $\bigcap_{n=1}^{\infty} (0, \exp(n))$ (d) $\bigcup_{n=1}^{\infty} (0, \exp((-1)^n n))$
(e) all of the above sets are bounded

2. Let $A = \{\sin(\pi n/2) + \frac{1}{n^2} \mid n \in \mathbb{N}\}$. Which one of the following statements is true?

- (a) $\sup A = 1$ (b) $\max A = 1$
(c) $\inf A = -1$ (d) $\min A = -1$
(e) none of the above statements is true

3. Let $s_n = (-1)^n + n$. Which one of the following statements holds true?

- (a) $s_n \rightarrow +\infty$ as $n \rightarrow \infty$ (b) $s_n \rightarrow -\infty$ as $n \rightarrow \infty$
(c) s_n converges as $n \rightarrow \infty$ (d) s_n is bounded
(e) none of the above is true

4. One says that a sequence s_n diverges to $+\infty$ as $n \rightarrow \infty$ if...

- (a) $\forall H \in \mathbb{R} \exists N \in \mathbb{N}$ such that $\forall n \leq N: s_n \geq H$
(b) $\exists L \in \mathbb{R}$ such that $\forall k \in \mathbb{N} \exists \ell \geq k: s_\ell \geq L$
(c) $\forall L \in \mathbb{R} \exists k \in \mathbb{N}$ such that $\forall \ell \geq k: s_\ell \geq L$
(d) $\forall H \in \mathbb{R} \exists N \in \mathbb{N}$ such that $\forall n \geq N: |s_n - H| \leq n$
(e) none of the above is correct

END OF TEST