MAS205 Complex Variables 2004-2005

Test I on Prerequisites, 26th September 2005, 11.40-11.55am

Name: Student Number:

Make sure to write your name and student number above. This is a "closed book" test. Calculators are not allowed.

Q1: Describe the set of points $(x, y) \in \mathbb{R}^2$ which satisfy $x^2 + y^2 \leq 9$.

Q2: Let $x \in \mathbb{R}$. Which of the following statements imply others? Example: (a) implies (b).

(a) $|x| < 2$ (b) $x^2 \leq 4$ (c) $x \in \{-1, 1\}$ (d) $x \geq -1$ (e) $x \in [1, 2]$

Q3: Compute

$$\lim_{x \to 0} \frac{1 - \cos x}{x}$$

Q4: Give an example of a real function f such that

$$\lim_{x \to -1} f(x) = +\infty$$

Q5: Compute $f'(0)$ for

(a) $f(x) = \sin(\cos x)$ (b) $f(x) = \cos(\sin x)$

Thomas Prellberg, September 2005