# UNIVERSITY OF NEW SOUTH WALES
## SCHOOL OF MATHEMATICS AND STATISTICS
## MATH1131 Mathematics 1A Calculus S1 2018
## TEST curves sample    VERSION 1a

This sheet must be filled in and stapled to the front of your answers

Student's Surname          Given Name or Initials          Student Number

Tutorial Code          Tutor's Name          Mark

**Note: The use of a calculator is not permitted in this test.**

**QUESTIONS**   *(Time allowed: 20 minutes)*

1. *(1 mark)*
   Determine whether the function $f(x) = (x^3 + x)\sin 4x$ is even, odd or neither of these.

2. *(3 marks)*
   Sketch the graph over the interval $[-3, 3]$ of the function which is defined for all $x \in \mathbb{R}$ by
   $$\begin{cases} f(x) = x^3 & \text{for } 0 \leqslant x \leqslant 1 \\ f(-x) = f(x) & \text{for all } x \\ f(x+2) = f(x) & \text{for all } x. \end{cases}$$

3. *(3 marks)*
   Sketch the graph of $f(x) = \dfrac{|x-2|}{x-3}$, $(x \neq 3)$ showing all asymptotes clearly, as well as any stationary points and intercepts of the curve on the $x$ and $y$ axes.

4. *(1 mark)*
   Determine whether the function $f(x) = x\sin 4x - x^3 \cos x$ is even, odd or neither of these.

5. *(2 marks)*
   Find all points at which the function
   $$f(x) = \frac{x+1}{x^2 - x - 2}$$
   is discontinuous.