

MATH191: Revision Problem

The examination for MATH191 is on the morning of Monday 7 January 2008, 10 a.m. to 1 p.m.. A selection of past papers (with solutions) is available on the module webpage. The paper has two sections, A and B. Section A consists of relatively short and easy questions, worth 55 marks in total. There is some choice on section B. These questions are somewhat harder, and each full question is worth 15 marks. Full marks are obtained by answering Section A fully, and three complete questions in Section B. In marking, the best three answers to section B are taken into account.

The best preparation for the examination is to practice by working through or reworking the questions already set. There is plenty of practice available on the problem and practice sheets. Here is one more typical section B type question to practice.

1. For each of the following of the following functions $f(x)$, determine and classify the stationary points, find any horizontal and vertical asymptotes, and sketch the graph:

$$\text{a) } x^3 - 3x + 1; \quad \text{b) } x + \frac{1}{x-1}.$$

Be careful to mark any horizontal or vertical asymptotes on your sketch. For part a), explain why there are zeros of f in $(-2, -1)$, $(0, 1)$ and $(1, 2)$. For part b) explain why f has no zeros at all.