

**M353 P5** (S. Zhang) Computer problems 5.4:c1,c3 .

1. (5.4:c1',c3') Use adaptive (a) trapezoid, (b) Simpson's quadrature to approximate the integral within (I)  $0.5 \times 10^{-3}$ , (II)  $0.5 \times 10^{-8}$

$$(1) \int_0^{\pi} x^2 \sin x dx$$

$$(2) \int_2^3 \frac{x^3 dx}{\sqrt{x^4 - 1}}$$

Find the exact answers by hand or Maple, and evaluate the answers to double precision (by Matlab or Maple).

Output 8 approximate integrals, 8 actual errors and 8 numbers of subintervals required.