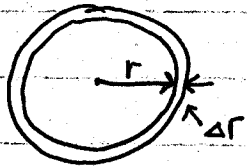


MAT 1500-03/11 OOF(Q8) Print Name (Last, First) jantzen, bob

Show all work on this sheet, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation. Box short final answers.

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①



- a) Compute the exact area  $\Delta A$  of the ring of inner radius  $r$  and outer radius  $r + \Delta r$ .
- b) Use the differential approximation to calculate this area, assuming  $\Delta r$  is much smaller than  $r$ .
- c) Evaluate the error (approx-exact) in this approximation, simplifying your result.

② Find the absolute maximum of the function  $f(x) = x^3 - x^2 - x$  on the interval  $-10 \leq x \leq 1$