

Math 5660 homework 1 due 9/4/02

1. (Backwards error analysis) Express the result of evaluation in floating point arithmetics of the inner product

$$\sum_{i=0}^n x_i y_i$$

as the result of exact arithmetic operations applied to perturbed data  $x_i(1 + \bar{\delta}_i), y_i(1 + \bar{\delta}_i)$ . Give an estimate of the  $\bar{\delta}_i, \bar{\delta}_i$  in terms of rounding precision  $\epsilon$ .

2. Section 2.2/Problem 9d