

- 1) (6 pt) Consider the list of numbers below:

1.777
0.003692
113.9
0.01992
34.39
0.5438

- What is the exact sum of these numbers?
 - Add the numbers from largest to smallest using 4 digit chopped arithmetic. What is the relative error in the result?
 - Add the numbers from smallest to largest using 4 digit chopped arithmetic. What is the relative error in the result?
 - Which of parts b) or c) above gives the most accurate result? Explain why one method has a smaller relative error than the other.
 - Based on your results, what is the most accurate way to add a series of numbers?
 - How would your answer to part e) change if you had both positive and negative numbers?
- 2) (6 pt) Solve the linear system below using 4 digit, chopped arithmetic. Compute the relative error in the final solution. How does your relative error compare with the examples done in class?

$$\begin{aligned} 113x + 114y &= 1 \\ 114x + 113y &= -1 \end{aligned}$$

The exact answer is $x = -1, y = 1$.

- 3) Suppose you have a computer designed with the following specifications:

- Base = 3
- Digits of accuracy = 4
- Exponent range = $[-2, 2]$

Answer the following questions:

- (1 pt) What is the largest positive number that can be represented?
- (1 pt) What the smallest positive number that can be represented assuming a standard normalizing rule?

You do not have to convert your numbers to base 10.