

# 5627: HW4

## 1. Linear Algebra

1.1. Do Ex 2.1.32

1.2. Do Ex 2.1.33

1.3. Do Ex 2.2.22

1.4. Do Ex 2.2.24

## 2. Floating Point

2.1. Approximate machine  $\epsilon$  for the software of your choice. Machine  $\epsilon$  is the largest value for which  $1.0 + \epsilon = 1.0$ . Explain your code.

2.2. In the software of your choice write a loop to compute the sum  $\sum_{i=0}^n 1.0/i$  for  $n = 23 \times 10^6$ . Do not use a built in sum command.

2.3. Add the numbers backwards. Compute the difference between your two answers? Explain?

2.4. Should the sum converge? Explain your answer and the numerical results you obtained.

2.5. How big would the difference be for  $n = 23 \times 10^7$ ? Explain.