

# Math 248 - HW 5

22.  $(a+b)+c$ ,  $a+(b+c)$  (5-digit mantissa)

$$a = 6.3121 \times 10^2 = 631.21$$

$$b = 4.2445 \times 10^0 = 4.2445$$

$$c = 2.4787 \times 10^{-2} = 0.024787$$

$$\text{Exact Answer} = 635.479287$$

$$\begin{aligned}(a+b)+c &= (631.21 + 4.2445) + 0.024787 \\ &= 635.4545 + 0.024787 \\ &= 635.47929\end{aligned}$$

$$\begin{aligned}a+(b+c) &= 631.21 + (4.2445 + 0.024787) \\ &= 631.21 + 4.26929 \\ &= 635.47929\end{aligned}$$

Both  $(a+b)+c$  and  $a+(b+c)$  have the same accuracy with a 5-digit mantissa

23. The expression  $\sum_{i=1}^{\infty} \frac{1}{i}$  would run forever on a computer<sup>1</sup> because the summation does not have a finite bound ( $\infty$ ). However if we tried, the sum would increase infinitely but very slowly.