Homework for Dr. Z.'s MathHistory for Lecture 7

0. Read and understand Chapter V, sections 1-6 (pp. 98- 109) summarize its content in your own words, and your own handwriting, and write it in your HISTORY notebook, [You should have at least the equivalent of two typed pages, but you are welcome to write more

The other problems should be either hand-written or typed and sent as .pdf file or .txt file (PLEASE no other formats) to DrZlinear@gmail.com by 8:00pm Sunday, Oct. 3, 2021 ,

Subject: hw7

with an attachment: hw7FirstLast.pdf (or hw7FirstLast.txt)

Also in the BODY of the homework, have your name and indicate whether it is OK to post the homework in my web-site.

1. In a certain country there are only two kinds of coins, one is worth 19 dollars each, and the other is worth 14 dollars each. How would you pay for a cup of coffee that costs exactly 1 dollar (without tipping!). What do you have to give to the cashier, and what does the cashier return to you?

2. In a certain country there are only two kinds of coins, one is worth 109 dollars, and the other worth 95 dollars. How would you pay for a cup of coffee that costs exactly 1 dollar (without tipping!). What do you have to give to the cashier, and what does the cashier return to you?

3. You have a weight-balance, but only own fundamental weights of 37 kgs and 16 kgs. But you have many of each. You need to buy 1 kg of coffee. How would you be able to measure it? Describe the fundamental weights that you would put on each side of the scale.

4. (Optional) Use the formula

$$x = a_1 n_2 \cdot (n_2^{-1} \pmod{n_1}) + a_2 n_1 \cdot (n_1^{-1} \pmod{n_2}) \pmod{n_1 n_2} \quad .$$

(for the smallest solution of $x \ mod \ n_1 = a_1$, $x \ mod \ n_2 = a_2$) to find the smallest positive integer such that

$$x \ mod \ 21 = 5 \quad , \quad x \ mod \ 25 = 8 \quad .$$