

Homework 1

0. Because of great rivers in Africa and Asia, people have enough water supply to live and develop. Many years before, China started using computation on harvest, organization and collection of taxes. Egyptian mathematics is also famous for its Papyrus Rhind and Moscow Papyrus. After Egyptian mathematics, Mesopotamian mathematics also rised to a high level.

1. When we need to find which number satisfy the question, first list all the number and count ~~each~~ with each $(\text{mod } n)$ so we have a list of remainder, like 5 has remainder (1, 2) when it $(\text{mod } 2)$ and $(\text{mod } 3)$. From the mapping list, we can find the solution.

$$2. \quad \frac{1}{2} + \frac{1}{3} + \frac{1}{5} = \frac{15+10+6}{30} = \frac{31}{30} = 1.03$$

$$\text{Egyptian fraction} : \quad \frac{1}{3} + \frac{2}{4} + \frac{1}{5}$$

this fraction ~~will be written in unit~~ is easy to understand and look suitable.

$$3. \quad a) \quad f(x) := (x \pmod{3}, x \pmod{7})$$

$$f(20) = (2, 6) \quad f(41) = (2, 2)$$

$$b) \quad f(x) := (x \pmod{3}, 4 \pmod{7})$$

$$f(4) = (1, 4) \quad f(25) = (1, 4)$$

$$c) \quad f(x) := (0 \pmod{3}, 2 \pmod{7})$$

$$f(9) = (0, 2) \quad f(30) = (0, 2)$$