Exercise 5.1 from textbook

The Rhind papyrus is an ancient Egyptian mathematical manuscript that is more than 3500 years old. Problem 79 of the Rhind papyrus poses a problem that can be paraphrased as follows: there are seven houses; in each house lives seven cats; each cat kills seven mice; each mouse has eaten seven spelt seeds; each spelt seed would have produced seven hekat of spelt. What is the sum of all of the named items? Solve this 3500 year old problem.

Solution

There are 7 houses. In each house lives 7 cats. This implies that there are $7 \times 7 = 49$ cats in total. Next, each of the 49 cats kills 7 mice. This implies that there are $49 \times 7 = 343$ mice in total. Again since each of the 343 mice has eaten 7 spelt seeds this again implies that there are $343 \times 7 = 2401$ seeds in total. Finally, each spelt seed would have produced 7 hekat, so there are $2401 \times 7 = 16807$ kehat in total.

Now, the sum of all the named items is $7 + 49 + 2401 + 16807 = 19607$.