EXERCISE 1
OPEN PROBLEMS IN NUMBER THEORY 2017/18
DUE DATE: MARCH 21, 2018

Exercise 1. *Show that a rational number is not normal (to any base).*

Exercise 2. *Show that the sequence of fractional parts* $\{\{\log n\} : n = 1, 2, \dots\}$ *is* dense *in* $[0, 1)$.

Exercise 3. *Using summation by parts, show that*

$$\sum_{n \leq x} \log n = x \log x - x + O(\log x)$$

$$\sum_{n=1}^{N} \frac{1}{n} = \log N + C + O(\frac{1}{N})$$

for some constant C.