

MTH 306 History of Math, Fall 2025

For Monday Oct 6th:

- (1) Read the handout.

HW4 Due Wed Oct 8th

- (1) At time $t = 0$ you turn on the light switch. After half a second you turn it off. After another quarter second you turn it back on, then turn it off after $\frac{1}{8}$ seconds, and so on. Is the light on or off at time $t = 1$?
- (2) Write out the truth tables for the following statements.
 - (a) P and Q
 - (b) $P \Rightarrow Q$
 - (c) $(P \text{ and not } P) \Rightarrow Q$
- (3) Diophantus's epigram is: His boyhood lasted for $\frac{1}{6}$ of his life, his beard grew after $\frac{1}{12}$ more; after $\frac{1}{7}$ more he married, and his son was born 5 years later; the son lived to half his father's age and the father died four years after his son. How old was Diophantus when he died?
- (4) Consider numbers of the form $n^2 + 1$. How many of them are prime? Spend about half an hour looking this up on the internet and write a summary of what you found. How easy did you find it to find this information?
- (5) Find an (elementary) estimate for the complexity of the Euclidean algorithm, i.e. if you start with two numbers a and b , what is the maximum number of operations/steps you need? What would you need to know to find an average complexity estimate?
- (6) As I was going to St Ives,
I met a man with seven wives,
Each wife had seven sacks,
Each sack had seven cats,
Each cat had seven kits:
Kits, cats, sacks, and wives,
How many were there going to St Ives?