Math 480 - Fall 2020 Homework 1 Due September 9, 2020 In mathematics you don't understand things. You just get used to them.

— John von Neumann

Turn in:

- (1) Use Euclid's Algorithm (by hand) to compute gcd(119,98).
- (2) Prove (using the definition of divisibility) that if $a \mid b$ and $b \mid c$ then $a \mid c$.
- (3) Modify the proof from class to prove that there are infinitely many primes which are 5 (mod 6).
- (4) In the SageMath assignment (You should find it in your project on CoCalc) write two functions slowgcd(a,b) and fastgcd(a,b). slowgcd(a,b) should work backward from the smaller value (b), testing smaller and smaller values until it finds one that divides both. fastgcd(a,b) should use Euclid's algorithm. Test the running time of both to compute gcd(10⁹ + 1, 10⁷ + 1).