

Discrete math review unit:

- ▶ Sets etc (Monday)
- ▶ More DM concepts; proof techniques (Wednesday)
- ▶ Finishing proof techniques; more proofs (Friday)
- ▶ Counting and cardinality (next week Monday)

Today:

- ▶ Set proofs
- ▶ Inductive proofs
- ▶ Proofs about numbers

1.

a.  $\forall a \in \mathbb{N}, \gcd(a, 0) = a$

b.  $\forall a, b \in \mathbb{N}, \gcd(a, b) = \gcd(b, a \% b).$

2.

a. If  $a \in \mathbb{N}$ ,  $p$  is a prime number, and  $p|a$ , then  $p \nmid (a + 1).$

b. The set of primes is infinite.

3.  $\sqrt{2}$  is irrational.

Do this next one for homework.

4.  $\forall r \in \mathbb{R}, \forall n \in \mathbb{N}, \sum_{i=0}^n r^i = \frac{r^{n+1}-1}{r-1}$