Proposition 2.21: There are no integers x such that $0 < x < 1$.

Corollary 2.22: Let $n \in \mathbb{Z}$. There are no integers x such that $n < x < n + 1$.

Proposition 2.23: Let $m, n \in \mathbb{N}$. If n is divisible by m, then $m \leq n$.

Proposition 2.24: For all $k \in \mathbb{N}$, $k^2 + 1 > k$.

Proposition 2.27: For all $k \in \mathbb{Z}$ such that $k \geq 2$, $k^2 < k^3$.

Proposition 2.33: Let A be a nonempty subset of Z. Suppose for some $b \in \mathbb{Z}$ that $b \leq a$ for all $a \in A$. Then A has a least element.

Hint: Proving the Well-Ordering Principle was hard work. But proving this proposition should not be. Just reformulate it into a form where you can apply the Well-Ordering Principle.

Project 2.35: Compute $\gcd(4, 6)$, $\gcd(7, 13)$, $\gcd(-4, 10)$ and $\gcd(-5, -15)$. You do **NOT** have to prove that you have found the gcd. But you do have to exhibit the integers x and y in the definition of the gcd.

Project 3.1: Express each of the following statements using quantifiers.

(i) There exists a smallest natural number.

(ii) There does not exist a smallest natural number.

(iii) Every integer is the product of two integers.

(iv) The equation $x^2 - 2y^2 = 3$ has an integer solution.

Project 3.7: Negate each of the following statements

(i) Every cubic polynomial has a real root.

(ii) G is normal and H is regular.

(iii) $\exists!0$ such that $\forall x$, $x + 0 = x$

(iv) The newspaper article was neither accurate nor entertaining.

(v) If $\gcd(m, n)$ is odd then m or n is odd.

(vi) H/N is a normal subgroup of G/N if and only if H is a normal subgroup of G

(vii) For each $\epsilon > 0$, there exists $N \in \mathbb{N}$ such that for all $n \geq N$, $|a_n - L| < \epsilon$