

Math 465 - Spring 2021

Homework 2

Due February 11, 2021

The kind of knowledge which is supported only by observations and is not yet proved must be carefully distinguished from the truth... Indeed, we should use such discovery as an opportunity to investigate more exactly the properties discovered and to prove or disprove them; in both cases we may learn something useful.

— Leonard Euler

- (1) Use Euclid's algorithm to find the $d = \gcd(486, 144)$. Then find integers x and y so that $486x + 144y = d$.
- (2) Show that if $\gcd(a, b) = 1$ and $\gcd(a, c) = 1$ then $\gcd(a, bc) = 1$. (Hint: Write out $1 = ax + by$ and $1 = aw + cz$ and multiply the equations.)
- (3) Use the previous problem to show, if $\gcd(a, b) = 1$ that $\gcd(a^2, b^2) = 1$.
- (4) 2-2.11, 2-4.1 (From the textbook).