MA 350 Number Theory – Spring 2024

Homework 5

Due: **April 12, 2024**

Submit your written work in Canvas as a single PDF file, and be sure to show your work. Answers without accompanying work will receive zero credit.

1. Using a suitable formula and showing each step clearly, find $\varphi(504)$.
2. Let p be a fixed prime. Prove that the function f defined by $f(n) = \gcd(p, n)$ is multiplicative, but not completely multiplicative.
3. Showing each step clearly, find all n such that $\varphi(n) = 10$.
4. Using suitable formulas, find $\sigma(70)$ and $\tau(60)$.
5. Using the formula for $\tau(n)$, determine the forms of positive integers that have exactly 4 divisors.