115 Homework 10

Not for grading, solutions posted next week

Question 1 Prove there are infinitely many solutions to $\tau(2) = 2$.

Question 2 Consider the RSA encryption system with $n = 65$. Find the decryption key d for $e = 5$ and for $e = 7$. Encrypt the message $P = 03$ with $e = 5$.

Question 3 Show that $1 = \sum_{d|n} \mu(d)\tau(n/d)$.

Question 4 (Rosen 8.4.8) If RSA encryption with key $(e, n) = (5, 2881)$ produces ciphertext 0504 1874 0347 0515 2088 2356 0736 0468, what is the plaintext?

Question 5 (Rosen 7.4.22) Compute $\prod_{d|n} \mu(d)$. Your answer should encompass three cases for n.

Question 6 List the main theorems proved in class. Indicate the method we employed to prove them.