MATH 2170-19W Problem Set 3

January 30, 2019

Due: in class, February 06, 2019

- [6] **Question 1.** Given $a = 2^8 5^4 7^3 11^4 17^1$ and $b = 2^5 3^5 5^3 11^2 13^3$, find the prime power factorizations of (a, b), [a, b], and ab.
- [5] **Question 2.** Find all four pairs of numbers $\langle a, b \rangle$ with $0 < a \le b$, (a, b) = 35 and [a, b] = 4900.
- [4] **Question 3.** Show that every positive integer can be written uniquely in the form n = ab, where a is square free and b is a square.
- [5] **Question 4.** Observe that (4m+1)(4n+1) = 4(4mn+m+n+1) and that 4m+3)(4n+3) = 4(4mn+3m+3n+2) + 1.

Prove that every positive integer n of the form 4k + 3 has an odd number of prime factors of the form 4k + 3.

[20] TOTAL