# 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 $a b$.
[5] Question 2. Find all four pairs of numbers $\langle a, b\rangle$ with $0<a \leq b,(a, b)=35$ and $[a, b]=$ 4900 .
[4] Question 3. Show that every positive integer can be written uniquely in the form $n=a b$, where $a$ is square free and $b$ is a square.
[5] Question 4. Observe that $(4 m+1)(4 n+1)=4(4 m n+m+n+1)$ and that $4 m+3)(4 n+3)=$ $4(4 m n+3 m+3 n+2)+1$.

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

