Math 255 - Spring 2022
Proofs and primes
10 points

This contains proofs on the factorization of integers into primes. This homework is worth 10 points.

1. Show that if $n > 4$ is a composite number, then n divides $(n-1)!$.

2. Let n be composite, and let p be the smallest prime factor of n. Prove that if $p > n^{1/3}$, then $\frac{n}{p}$ is a prime number.

3. True or false: Let n be a positive integer. If p and q are distinct primes that divide n, and each is greater than $n^{1/4}$, then $\frac{n}{pq}$ is an integer and is prime.

   If this statement is true, prove it. If it is false, give a counter-example.