Assignment #1
Jackson Petty
MATH 350
Due on August 12, 2018

Problem 1. Prove that there are infinitely many prime numbers.

Proof. Let S be a set of finitely many primes. Let q be one more than the product of all elements of S. Consider that if q is prime, then there must obviously be at least one prime number which is not enumerated in S. On the other hand, if q is not prime, then by the fundamental theorem of algebra there must exist at least one prime factor of q, and this factor is not included in S since q is not divisible by any elements of S. Thus any finite enumeration of primes is necessarily incomplete. ■

Problem 2. What is the air-speed velocity of an unladen swallow?

Solution. African or European? ■

Exercise 1. Go outside and find some fossils, because fossils are cool.

Solution.

$$\int_0^{\pi/6} \sec y \, \mathrm{d}y = \ln \sqrt{3} \cdot i^{64}$$

■