INTRO TO HIGHER MATH
HOMEWORK 5 DUE OCTOBER 10

(1) Exercise 3.20 in text
(2) Exercise 3.24 in text
(3) Let $P_k = \{\text{primes } p \in \mathbb{N} \mid p \equiv k \pmod{3}\}$.
   (a) Give an explicit description of P_0.
   (b) Prove that P_2 is infinite. (Hint: By way of contradiction, assume that $P_2 = \{p_1, p_2, \ldots, p_n\}$ is finite. Consider the number $3p_1 p_2 \ldots p_n + 2$.)
   (c) One might hope to similarly prove that P_1 is infinite. Explain why the method of proof in part (b) will not work.