

**Fall 2023, Math 320: Preliminary Problem Set 11**  
**Due: Thursday, November 9th, 2023**  
**Congruence Classes in  $F[x]$**

**Preliminary problems.** These problems should be completed before discussion on Thursday.

(P1) Consider the ring  $R = \mathbb{Z}_3[x]/\langle x^2 + 2x + 2 \rangle$ .

(a) List all 9 elements of  $R$ .

(b) Find  $[x + 2] + [2x + 2]$  and  $[x + 2][2x + 2]$  in  $R$ .