

Fall 2023, Math 320: Preliminary Problem Set 9
Due: Thursday, October 26th, 2023
Polynomial Rings and Divisibility

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

- (P1) Use the division algorithm (i.e., polynomial long division) to divide $f(x) = x^5 + x^3 + x + 1$ by $g(x) = 3x^2 + 5x + 2$, viewed as elements of $\mathbb{Z}_7[x]$. Write your final answer in the form $f(x) = q(x)g(x) + r(x)$.

- (P2) Based on your answer in (P1), does $g(x)$ divide $f(x)$?