Intro to Modern Algebra
Recitation 7

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Step 3:
Let $f(x) = 3x^3 + x^2 + 2x$ and $g(x) = 2x^2 + x + 4$

b) If f and g are elements of $\mathbb{Z}_5[x]$, use long division to find $q(x)$ and $r(x)$ so that $f(x) = g(x)q(x) + r(x)$.

$$
\begin{array}{r|l}
 & \quad 4x\ +1 \\
\hline
2x^2 + x + 4 & \ 3x^3\ +x^2\ +2x+2 \\
 & -3x^3-4x^2\ -x \\
\hline
 & \ 0\ \ +2x^2\ +x\ +2 \\
 & \quad -2x^2\ -x\ -4 \\
\hline
 & \quad 0\ \ \ +0\ +3
\end{array}
$$

$f(x) = 4x + 1$ and $g(x) = 3$