Math 5385
12 March, 2015
§2.7.2.

Problem 2, p. 94

"2. Use the algorithm given in Theorem 2 to find a Groebner basis for each of the following ideals. You may wish to use a computer algebra system to compute the S-polynomials and remainders. Use the lex, then the grlex order in each case, and then compare your results."

Ideal	G_{Lex} (x>y>z)	G_{Grlex} (x>y>z)
$< x^2y-1,\ xy^2-x >$	$g1 = x^2y-1$ $g2 = xy^2-x$ $g3 = x^2-y$ $g4 = y^2-1$ $g5 = y^3-y$	Same g1,...,g5 as in G_{Lex}
$< x^2+y,\ x^4+2x^2y+y^2+3 >$	$g1 = x^2+y$ $g2 = x^4+2x^2y+y^2+3$ $g3 = 3$	same as G_{Lex}
$< x-z^4,\ y-z^5 >$	$g1 = x-z^4$ $g2 = y-z^5$	$g1 = -z^4+x$ $g2 = -z^5+y$ $g3 = -xz+y$ $g4 = yz^3-x^2$ $g5 = -y^2z^2+x^3$ $g6 = x^4-y^3z$