QUIZ 2

Instructions: Please write your name at the top of the page. Show all your work and explain your reasoning unless otherwise indicated.

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(1) (10 points). Let $S = \mathbb{Q}[x, y, z]$ with the graded reverse lexicographic order where $x > y > z$. Divide

$$f = x^3y + xy^2z + 2x^2z^2 + xz^3 - z^4 + y^3$$

by the ordered list

$$g_1 = x^2 - yz, \qquad g_2 = xy - z^2, \qquad g_3 = y^2 - xz.$$

Using the multivariable division algorithm in this order, write

$$f = q_1g_1 + q_2g_2 + q_3g_3 + r,$$

and give q_1, q_2, q_3 and the remainder r.