

MATH 602(HOMEWORK 3)

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1. EXERCISES

Exercise. (Exercise 1) The ideal generated by the three polynomials contains $-yz^4 + yz^2 + y = (xy^2 - xz + y) - y(xy - z^2) + z(x - yz^4)$. However, its leading term $-yz^4$ is not in the ideal generated by the leading terms of the three polynomials.

Exercise. (Exercise 2)

Solve this.

Exercise. (Exercise 3)

Solve this.

Exercise. (Exercise 4) $0 \in \sqrt{0}, a, b \in \sqrt{0} \implies (a+b)^{m+n-1} = \sum_{i=0}^{m+n-1} \binom{m+n-1}{i} a^i b^{m+n-1-i} = 0$, and $\forall a \in \sqrt{0}, \forall x \in R, (ax)^n = a^n x^n = 0$, so $\sqrt{0}$ is an ideal.

Exercise. (Exercise 5)

Solve this.

Exercise. (Exercise 6) Tensoring an exact sequence with $M \otimes_A N$ is the same as tensoring it with M first and tensoring the resulting sequence with N later.