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.