Proj

Arnaud Mayeux   Jujian Zhang

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0.1 Homogeneous Submonoids

Let A be a graded ring.

Definition 1. We say S is a homogeneous submonoid of A if S is a submonoid of A and for every $s \in S$, s is a homogeneous element of A.

Theorem 2. *If A is graded by M where M is an abelian group written additively, then A_S is a graded ring by M as well.*

Definition 3. Let S be a homogeneous submonoid of A, we define $\deg(S)$ to be the submonoid of M to be

$$\{i | \exists x \in S, x \in A_i\}.$$