1077-05-545 **David W. Cook II*** (dcook@ms.uky.edu), 715 Patterson Office Tower, Department of Mathematics, University of Kentucky, Lexington, KY 40506-0027, and **Uwe Nagel** (uwe.nagel@uky.edu). *Enumerations deciding the weak Lefschetz property.*

We introduce a natural correspondence between artinian monomial almost complete intersections in three variables and punctured hexagons. We use this correspondence to investigate the algebras for the presence of the weak Lefschetz property. In particular, we relate the field characteristics in which such an algebra fails to have the weak Lefschetz property to the prime divisors of the enumeration of signed lozenge tilings of the associated punctured hexagon.

We establish formulae for the enumeration of signed lozenge tilings for several families of punctured hexagons. This allows us to establish the presence of the weak Lefschetz property for the associated algebras. We also offer a conjecture of a closed formula for the enumerations of signed lozenge tilings of symmetric punctured hexagons. (Received September 07, 2011)