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University of Kentucky, 715 Patterson Office Tower, Lexington, KY 40506-0027. *Enumerations  
deciding the weak Lefschetz property.*

We introduce a natural correspondence between artinian monomial almost complete intersections in three variables and punctured hexagonal regions. 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 hexagonal region. On the one side this allows us to establish the weak Lefschetz property in many new cases. On the other side, we can determine some of the prime divisors of the enumerations by means of an algebraic argument. (Received August 01, 2011)