MATH 499/696, SPRING 2010, HOMEWORK 7
DUE FRIDAY 07 MAY

Exercise: Let A be a commutative ring with identity and let R be the polynomial ring $R = A[X, Y]$ in 2 variables. Set $I = (X^4, X^3Y, Y^2)R$ and $J = (X^3, XY, Y^4)R$ and $K = IJ$.

(a) Use the algorithm from class to find an irredundant m-irreducible decomposition $K = \cap_{i=1}^{n} K_i$.

(b) Check your answer for part (a) as follows:
- (1) Compute an irredundant monomial generating sequence for K using the generators for I and J.
- (2) Compute an irredundant monomial generating sequence for K using the generators for $K_1, \ldots, K_n$.
- (3) Check that the generating sequences from parts (1) and (2) are the same.

Be sure to justify your answers.