1103-14-81 **Brian Harbourne*** (`bharbourne1@unl.edu`), Math Department, University of Nebraska-Lincoln, Lincoln, NE 68588. *Open problems on negativity in algebraic geometry and connections to combinatorics and commutative algebra.* Preliminary report.

An open question involving projective plane curves is how negative reduced curves can be. This question is interesting only for singular curves. So let C be a singular plane curve defined by a square free homogeneous polynomial F_C of degree d. Let s be the number of singular points of C and let the multiplicities of the singularities of C be $m_1, \dots, m_s$. Define the negativity N_C of C to be $N_C = (d^2 - m_1^2 - \cdots - m_s^2)/s$. It is an open problem to determine a lower bound on the possible values of N_C over all reduced curves C, or even to show a bound exists. Examples of curves C with $N_C \leq -3$ are rare and none are known with $N_C \leq -4$. This problem is closely related to seemingly unrelated problems in combinatorics (such as finding finite sets of lines such that there are no points where exactly two of the lines cross) and commutative algebra (such as finding examples of ideals I of finite sets of points in the plane such that $I^{(3)} \not\subseteq I^2$). I will discuss connections between these problems, and some recent results. (Received August 13, 2014)