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Effective bounds on the index
of Castelnuovo-Mumford regularity
in low-dimensional cases

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We use a simple coherent approach, based on a “general position” lemma for homogeneous polynomials, to obtain effective bounds of the type stated in the title, these bounds depending on the degrees of the generators of the given homogeneous ideal in a standard graded algebra. As a result we can present a quick proof of a classical theorem of Macaulay (in dimension -1), and generalize and greatly simplify the proof of a result of Cheltsov (in dimension 0). We are also able to give a somewhat refined version of a theorem of Shiffman (in dimension 0) with a proof that avoids Shiffman's original use of spectral sequences. Instead our approach here is based on a lovely little paper of Briançon and uses properties of Hilbert functions. We have a result for saturated ideals in dimension 1 , but hope for a general result in this and indeed in any dimension.
