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Green's theorem and Gorenstein sequences

This is a joint work with Juan Migliore and J. Ahn. We study consequences, for a standard graded algebra, of extremal behavior in Green's Hyperplane Restriction Theorem. First, we extend his Theorem 4 from the case of a plane curve to the case of a hypersurface in a linear space. Second, assuming a certain Lefschetz condition, we give a connection to extremal behavior in Macaulay's theorem. We apply these results to show that  $(1, 19, 17, 19, 1)$  is not a Gorenstein sequence, and as a result we classify the sequences of the form  $(1, a, a - 2, a, 1)$  that are Gorenstein sequences.