Negative evaluations of the chromatic polynomial and its derivatives.

The chromatic polynomial $\chi_G$ of a graph $G$ evaluated at positive integer $q$ gives the number of proper colorings of $G$ in $q$ colors. We give an interpretation of the value of the derivatives of $\chi_G$ at non-positive integers in terms of acyclic orientations of $G$. Our result generalize formulas obtained by Stanley, Gessel and Sagan, Gessel and Lass. The proof is an application of heap theory in the spirit of [Gessel 2001].

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