Polynomial weights and code constructions

For any nonzero element $c$ of a general finite field $\mathbb{F}_q$, it is shown that the polynomials $(x - c)^i$, $i = 0, 1, 2, \ldots$, have the "weight-retaining" property that any linear combination of these polynomials with coefficients in $\mathbb{F}_q$ has Hamming weight at least as great as that of the minimum degree polynomial included. This fundamental property is then used as the key to a variety of code constructions including 1) a simplified derivation of the binary Reed-Muller codes and, for any prime $p$ greater than 2, a new extensive class of $p$-ary "Reed-Muller codes," 2) a new class of "repeated-root" cyclic codes that are subcodes of the binary Reed-Muller codes and can be very simply instrumented, 3) a new class of constacyclic codes that are subcodes of the $p$-ary "Reed-Muller codes," 4) two new classes of binary convolutional codes with large "free distance" derived from known binary cyclic codes, 5) two new classes of long constraint length binary convolutional codes derived from $2^r$-ary Reed-Solomon codes, and 6) a new class of $q$-ary "repeated-root" constacyclic codes with an algebraic decoding algorithm.