

# WARING DECOMPOSITIONS OF A GENERAL POLYNOMIAL VECTOR

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Weierstrass canonical form expresses a pair of general quadratical forms as a sum of powers of the same linear forms. It is one of the many displays of the well known Spectral Theorem. The uniqueness is remarkable because it does not hold for a single quadratical form, but it holds for four quadratical forms in three variables. These are called (simultaneous) Waring decompositions, and when uniqueness holds they are canonical. The term identifiable is equivalently used in the applied setting. A classical (sometimes forgotten) Theorem by Roberts gives a similar canonical form for a pair given by two forms of degrees 2 and 3 in three variables, this result has a natural Euclidean meaning. We have found another canonical form, likely the last one, for three forms of degrees 3, 3, 4 in three variables.

*Joint work with Elena Angelini (Università di Siena, Italy), Francesco Galuppi (Università di Ferrara, Italy) and Massimiliano Mella (Università di Ferrara, Italy).*