Let \( q(x_0, x_1, x_2) \) be a homogeneous polynomial of degree 2 in 3 variables, with rational coefficients. Assume that \( q \) admits a non-trivial real zero and that \( q \) is irreducible over the field \( \mathbb{Q} \) of rational numbers. Denote by \( U \) the set of real zeros of \( q \) having \( \mathbb{Q} \)-linearly independent coordinates. We show that

a) each point in \( U \) has an exponent of uniform rational approximation between \( 1/2 \) and \( 1/\gamma \approx 0.618 \), where \( \gamma \) denotes the golden ratio,

b) the elements of \( U \) for which the upper bound is achieved form an infinite countable set.

For \( q(x_0, x_1, x_2) = x_0 x_2 - x_1^2 \), the statement a) is due to Davenport and Schmidt (1967) while b) is due to the author (2003). When \( q \) is irreducible over \( \mathbb{R} \) and admits a non-trivial rational zero, we are quickly reduced to that case. Otherwise, the proof of a) is simpler, but the existence of ”extremal” points in b) requires additional tools.