Abstract: It is known that all primitive Pythagorean triples \((x, y, z)\), that is, all positive integer triples \((x, y, z)\) without common factor satisfying \(x^2 + y^2 - z^2 = 0\), can be given a certain tree-like structure. More precisely, if \((x, y, z)\) is such a triple with \(y\) even, then there exists a unique sequence \(\{k_1, \ldots, k_l\}\) with \(k_j \in \{1, 2, 3\}\) such that \((x, y, z)^T = M_{k_1} \cdots M_{k_l} (3, 4, 5)^T\) with

\[
M_1 := \begin{pmatrix} 1 & -2 & 2 \\ 2 & -1 & 2 \\ 2 & -2 & 3 \end{pmatrix}, \quad M_2 := \begin{pmatrix} -1 & 2 & 2 \\ -2 & 1 & 2 \\ -2 & 2 & 3 \end{pmatrix}, \quad M_3 := \begin{pmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 3 \end{pmatrix}.
\]

We present a generalization of this theorem to different quadratic forms other than the Pythagorean one.

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Thursday, March 17, 2016
2:40–4:00PM
Bryn Mawr College
Department of Mathematics
Park Science Center 328
Tea and refreshments at 2:20PM in Park 355