1086-VR-1239 **Donald A. Sokol*** (vsokol@sbcglobal.net), 11S047 Palisades Road, Burr Ridge, IL 60527. *The Many Faces of a Pythagorean Triple.*

The Many Faces of a Pythagorean Triple It is widely held in the mathematical world that given two non-negative integers x and y with x greater than y, x and y having opposite parity and being relatively prime will produce a Pythagorean triple in terms of a, b and c as follows: a = x squared − y squared; b= 2 x y; and c = x squared + y squared, such that a, b, and c satisfy the Pythagorean relationship: a squared + b squared = c squared. What is not often discussed, and is the purpose of this paper, is the change in the identity of each triple (a, b, c) when either the sum or difference of the two integers (x, y) is substituted for either x or y in these equations. Not only does this allow all eight variations of an individual prime triple (3, 4, 5) to be easily calculated, it enhances the ability to deal with negative numbers and it permits integers of equal parity to be addressed. The use of non-integer values through scaling, i.e. (13 can be 1.3 or 0.13) is also possible. Finally, the shift in the identity of each triple associated with each change in the equations bears a significant likeness to the characteristics of a code, suggesting one may be imbedded in this vast system of Pythagorean triples. This vast system may not be just for triangles anymore. (Received September 20, 2012)