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# Palindromic-Type Pandigital Patterns in Pythagorean Triples

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*This short paper brings without much details examples of **Palindromic-Type Pandigital Patterns in Pythagorean Triples**. The detailed construction can be seen in author's work [4]. This work is divided in three Groups. First two groups are with 9 patterns each, while the third group can go up to 99 patterns*

## 1 First Group

$$\begin{aligned}
 099^2 + 20^2 &= \mathbf{101}^2 \\
 12099^2 + 220^2 &= \mathbf{12101}^2 \\
 1232099^2 + 2220^2 &= \mathbf{1232101}^2 \\
 123432099^2 + 22220^2 &= \mathbf{123432101}^2 \\
 12345432099^2 + 222220^2 &= \mathbf{12345432101}^2 \\
 1234565432099^2 + 2222220^2 &= \mathbf{1234565432101}^2 \\
 123456765432099^2 + 22222220^2 &= \mathbf{123456765432101}^2 \\
 12345678765432099^2 + 222222220^2 &= \mathbf{12345678765432101}^2 \\
 1234567898765432099^2 + 2222222220^2 &= \mathbf{1234567898765432101}^2
 \end{aligned} \tag{1.1}$$

$$\begin{aligned}
 096^2 + 40^2 &= \mathbf{104}^2 \\
 12096^2 + 440^2 &= \mathbf{12104}^2 \\
 1232096^2 + 4440^2 &= \mathbf{1232104}^2 \\
 123432096^2 + 44440^2 &= \mathbf{123432104}^2 \\
 12345432096^2 + 444440^2 &= \mathbf{12345432104}^2 \\
 1234565432096^2 + 4444440^2 &= \mathbf{1234565432104}^2 \\
 123456765432096^2 + 44444440^2 &= \mathbf{123456765432104}^2 \\
 12345678765432096^2 + 444444440^2 &= \mathbf{12345678765432104}^2 \\
 1234567898765432096^2 + 4444444440^2 &= \mathbf{1234567898765432104}^2
 \end{aligned} \tag{1.2}$$

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$$\begin{aligned}
091^2 + 60^2 &= \mathbf{109^2} \\
12091^2 + 660^2 &= \mathbf{12109^2} \\
1232091^2 + 6660^2 &= \mathbf{1232109^2} \\
123432091^2 + 66660^2 &= \mathbf{123432109^2} \\
12345432091^2 + 666660^2 &= \mathbf{12345432109^2} \\
1234565432091^2 + 6666660^2 &= \mathbf{1234565432109^2} \\
123456765432091^2 + 66666660^2 &= \mathbf{123456765432109^2} \\
12345678765432091^2 + 666666660^2 &= \mathbf{12345678765432109^2} \\
1234567898765432091^2 + 6666666660^2 &= \mathbf{1234567898765432109^2} \tag{1.3}
\end{aligned}$$

$$\begin{aligned}
084^2 + 80^2 &= \mathbf{116^2} \\
12084^2 + 880^2 &= \mathbf{12116^2} \\
1232084^2 + 8880^2 &= \mathbf{1232116^2} \\
123432084^2 + 88880^2 &= \mathbf{123432116^2} \\
12345432084^2 + 888880^2 &= \mathbf{12345432116^2} \\
1234565432084^2 + 8888880^2 &= \mathbf{1234565432116^2} \\
123456765432084^2 + 88888880^2 &= \mathbf{123456765432116^2} \\
12345678765432084^2 + 888888880^2 &= \mathbf{12345678765432116^2} \\
1234567898765432084^2 + 8888888880^2 &= \mathbf{1234567898765432116^2} \tag{1.4}
\end{aligned}$$

$$\begin{aligned}
075^2 + 100^2 &= \mathbf{125^2} \\
12075^2 + 1100^2 &= \mathbf{12125^2} \\
1232075^2 + 11100^2 &= \mathbf{1232125^2} \\
123432075^2 + 111100^2 &= \mathbf{123432125^2} \\
12345432075^2 + 1111100^2 &= \mathbf{12345432125^2} \\
1234565432075^2 + 11111100^2 &= \mathbf{1234565432125^2} \\
123456765432075^2 + 111111100^2 &= \mathbf{123456765432125^2} \\
12345678765432075^2 + 1111111100^2 &= \mathbf{12345678765432125^2} \\
1234567898765432075^2 + 11111111100^2 &= \mathbf{1234567898765432125^2} \tag{1.5}
\end{aligned}$$

$$\begin{aligned}
064^2 + 120^2 &= \mathbf{136^2} \\
12064^2 + 1320^2 &= \mathbf{12136^2} \\
1232064^2 + 13320^2 &= \mathbf{1232136^2} \\
123432064^2 + 133320^2 &= \mathbf{123432136^2} \\
12345432064^2 + 1333320^2 &= \mathbf{12345432136^2} \\
1234565432064^2 + 13333320^2 &= \mathbf{1234565432136^2} \\
123456765432064^2 + 133333320^2 &= \mathbf{123456765432136^2} \\
12345678765432064^2 + 1333333320^2 &= \mathbf{12345678765432136^2} \\
1234567898765432064^2 + 13333333320^2 &= \mathbf{1234567898765432136^2} \tag{1.6}
\end{aligned}$$

$$\begin{aligned}
&051^2 + 140^2 &&= 149^2 \\
&12051^2 + 1540^2 &&= 12149^2 \\
&1232051^2 + 15540^2 &&= 1232149^2 \\
&123432051^2 + 155540^2 &&= 123432149^2 \\
&12345432051^2 + 1555540^2 &&= 12345432149^2 \\
&1234565432051^2 + 15555540^2 &&= 1234565432149^2 \\
&123456765432051^2 + 155555540^2 &&= 123456765432149^2 \\
&12345678765432051^2 + 1555555540^2 &&= 12345678765432149^2 \\
&1234567898765432051^2 + 15555555540^2 &&= 1234567898765432149^2
\end{aligned} \tag{1.7}$$

$$\begin{aligned}
&036^2 + 160^2 &&= 164^2 \\
&12036^2 + 1760^2 &&= 12164^2 \\
&1232036^2 + 17760^2 &&= 1232164^2 \\
&123432036^2 + 177760^2 &&= 123432164^2 \\
&12345432036^2 + 1777760^2 &&= 12345432164^2 \\
&1234565432036^2 + 17777760^2 &&= 1234565432164^2 \\
&123456765432036^2 + 177777760^2 &&= 123456765432164^2 \\
&12345678765432036^2 + 1777777760^2 &&= 12345678765432164^2 \\
&1234567898765432036^2 + 17777777760^2 &&= 1234567898765432164^2
\end{aligned} \tag{1.8}$$

$$\begin{aligned}
&019^2 + 180^2 &&= 181^2 \\
&12019^2 + 1980^2 &&= 12181^2 \\
&1232019^2 + 19980^2 &&= 1232181^2 \\
&123432019^2 + 199980^2 &&= 123432181^2 \\
&12345432019^2 + 1999980^2 &&= 12345432181^2 \\
&1234565432019^2 + 19999980^2 &&= 1234565432181^2 \\
&123456765432019^2 + 199999980^2 &&= 123456765432181^2 \\
&12345678765432019^2 + 1999999980^2 &&= 12345678765432181^2 \\
&1234567898765432019^2 + 19999999980^2 &&= 1234567898765432181^2
\end{aligned} \tag{1.9}$$

## 2 Second Group

$$\begin{aligned}
 &0099^2 + 20^2 &&= 101^2 \\
 &1020099^2 + 2020^2 &&= 1020101^2 \\
 &10203020099^2 + 202020^2 &&= 10203020101^2 \\
 &102030403020099^2 + 20202020^2 &&= 102030403020101^2 \\
 &1020304050403020099^2 + 2020202020^2 &&= 1020304050403020101^2 \\
 &10203040506050403020099^2 + 202020202020^2 &&= 10203040506050403020101^2 \\
 &102030405060706050403020099^2 + 20202020202020^2 &&= 102030405060706050403020101^2 \\
 &1020304050607080706050403020099^2 + 2020202020202020^2 &&= 1020304050607080706050403020101^2 \\
 &10203040506070809080706050403020099^2 + 202020202020202020^2 &&= 10203040506070809080706050403020101^2 \quad (2.1)
 \end{aligned}$$

$$\begin{aligned}
 &0096^2 + 40^2 &&= 104^2 \\
 &1020096^2 + 4040^2 &&= 1020104^2 \\
 &10203020096^2 + 404040^2 &&= 10203020104^2 \\
 &102030403020096^2 + 40404040^2 &&= 102030403020104^2 \\
 &1020304050403020096^2 + 4040404040^2 &&= 1020304050403020104^2 \\
 &10203040506050403020096^2 + 404040404040^2 &&= 10203040506050403020104^2 \\
 &102030405060706050403020096^2 + 40404040404040^2 &&= 102030405060706050403020104^2 \\
 &1020304050607080706050403020096^2 + 4040404040404040^2 &&= 1020304050607080706050403020104^2 \\
 &10203040506070809080706050403020096^2 + 404040404040404040^2 &&= 10203040506070809080706050403020104^2 \quad (2.2)
 \end{aligned}$$

$$\begin{aligned}
 &0091^2 + 60^2 &&= 109^2 \\
 &1020091^2 + 6060^2 &&= 1020109^2 \\
 &10203020091^2 + 606060^2 &&= 10203020109^2 \\
 &102030403020091^2 + 60606060^2 &&= 102030403020109^2 \\
 &1020304050403020091^2 + 6060606060^2 &&= 1020304050403020109^2 \\
 &10203040506050403020091^2 + 606060606060^2 &&= 10203040506050403020109^2 \\
 &102030405060706050403020091^2 + 60606060606060^2 &&= 102030405060706050403020109^2 \\
 &1020304050607080706050403020091^2 + 6060606060606060^2 &&= 1020304050607080706050403020109^2 \\
 &10203040506070809080706050403020091^2 + 606060606060606060^2 &&= 10203040506070809080706050403020109^2 \quad (2.3)
 \end{aligned}$$

$$\begin{aligned}
 &0084^2 + 80^2 &&= 116^2 \\
 &1020084^2 + 8080^2 &&= 1020116^2 \\
 &10203020084^2 + 808080^2 &&= 10203020116^2 \\
 &102030403020084^2 + 80808080^2 &&= 102030403020116^2 \\
 &1020304050403020084^2 + 8080808080^2 &&= 1020304050403020116^2 \\
 &10203040506050403020084^2 + 808080808080^2 &&= 10203040506050403020116^2 \\
 &102030405060706050403020084^2 + 80808080808080^2 &&= 102030405060706050403020116^2 \\
 &1020304050607080706050403020084^2 + 8080808080808080^2 &&= 1020304050607080706050403020116^2 \\
 &10203040506070809080706050403020084^2 + 808080808080808080^2 &&= 10203040506070809080706050403020116^2 \quad (2.4)
 \end{aligned}$$

$$\begin{aligned}
 0075^2 + 100^2 &= 125^2 \\
 1020075^2 + 10100^2 &= 1020125^2 \\
 10203020075^2 + 1010100^2 &= 10203020125^2 \\
 102030403020075^2 + 101010100^2 &= 102030403020125^2 \\
 1020304050403020075^2 + 10101010100^2 &= 1020304050403020125^2 \\
 10203040506050403020075^2 + 1010101010100^2 &= 10203040506050403020125^2 \\
 102030405060706050403020075^2 + 101010101010100^2 &= 102030405060706050403020125^2 \\
 1020304050607080706050403020075^2 + 10101010101010100^2 &= 1020304050607080706050403020125^2 \\
 10203040506070809080706050403020075^2 + 1010101010101010100^2 &= 10203040506070809080706050403020125^2 \quad (2.5)
 \end{aligned}$$

$$\begin{aligned}
 0064^2 + 120^2 &= 136^2 \\
 1020064^2 + 12120^2 &= 1020136^2 \\
 10203020064^2 + 1212120^2 &= 10203020136^2 \\
 102030403020064^2 + 121212120^2 &= 102030403020136^2 \\
 1020304050403020064^2 + 12121212120^2 &= 1020304050403020136^2 \\
 10203040506050403020064^2 + 1212121212120^2 &= 10203040506050403020136^2 \\
 102030405060706050403020064^2 + 121212121212120^2 &= 102030405060706050403020136^2 \\
 1020304050607080706050403020064^2 + 12121212121212120^2 &= 1020304050607080706050403020136^2 \\
 10203040506070809080706050403020064^2 + 1212121212121212120^2 &= 10203040506070809080706050403020136^2 \quad (2.6)
 \end{aligned}$$

$$\begin{aligned}
 0051^2 + 140^2 &= 149^2 \\
 1020051^2 + 14140^2 &= 1020149^2 \\
 10203020051^2 + 1414140^2 &= 10203020149^2 \\
 102030403020051^2 + 141414140^2 &= 102030403020149^2 \\
 1020304050403020051^2 + 14141414140^2 &= 1020304050403020149^2 \\
 10203040506050403020051^2 + 1414141414140^2 &= 10203040506050403020149^2 \\
 102030405060706050403020051^2 + 141414141414140^2 &= 102030405060706050403020149^2 \\
 1020304050607080706050403020051^2 + 14141414141414140^2 &= 1020304050607080706050403020149^2 \\
 10203040506070809080706050403020051^2 + 1414141414141414140^2 &= 10203040506070809080706050403020149^2 \quad (2.7)
 \end{aligned}$$

$$\begin{aligned}
 0036^2 + 160^2 &= 164^2 \\
 1020036^2 + 16160^2 &= 1020164^2 \\
 10203020036^2 + 1616160^2 &= 10203020164^2 \\
 102030403020036^2 + 161616160^2 &= 102030403020164^2 \\
 1020304050403020036^2 + 16161616160^2 &= 1020304050403020164^2 \\
 10203040506050403020036^2 + 1616161616160^2 &= 10203040506050403020164^2 \\
 102030405060706050403020036^2 + 161616161616160^2 &= 102030405060706050403020164^2 \\
 1020304050607080706050403020036^2 + 16161616161616160^2 &= 1020304050607080706050403020164^2 \\
 10203040506070809080706050403020036^2 + 1616161616161616160^2 &= 10203040506070809080706050403020164^2 \quad (2.8)
 \end{aligned}$$

$$\begin{aligned}
 0019^2 + 180^2 &= 181^2 \\
 1020019^2 + 18180^2 &= 1020181^2 \\
 10203020019^2 + 1818180^2 &= 10203020181^2 \\
 102030403020019^2 + 181818180^2 &= 102030403020181^2 \\
 1020304050403020019^2 + 18181818180^2 &= 1020304050403020181^2 \\
 10203040506050403020019^2 + 1818181818180^2 &= 10203040506050403020181^2 \\
 102030405060706050403020019^2 + 181818181818180^2 &= 102030405060706050403020181^2 \\
 1020304050607080706050403020019^2 + 18181818181818180^2 &= 1020304050607080706050403020181^2 \\
 10203040506070809080706050403020019^2 + 1818181818181818180^2 &= 10203040506070809080706050403020181^2 \quad (2.9)
 \end{aligned}$$

### 3 Third Group

This group is very much similar to second. Only difference is in fixed values.

$$\begin{aligned}
 9999^2 + 200^2 &= 10001^2 \\
 102009999^2 + 20200^2 &= 102010001^2 \\
 1020302009999^2 + 2020200^2 &= 1020302010001^2 \\
 10203040302009999^2 + 202020200^2 &= 10203040302010001^2 \\
 102030405040302009999^2 + 20202020200^2 &= 102030405040302010001^2 \\
 1020304050605040302009999^2 + 2020202020200^2 &= 1020304050605040302010001^2 \\
 10203040506070605040302009999^2 + 202020202020200^2 &= 10203040506070605040302010001^2 \\
 102030405060708070605040302009999^2 + 20202020202020200^2 &= 102030405060708070605040302010001^2 \\
 1020304050607080908070605040302009999^2 + 20202020202020200^2 &= 1020304050607080908070605040302010001^2 \quad (3.1)
 \end{aligned}$$

$$\begin{aligned}
 009996^2 + 400^2 &= 10004^2 \\
 102009996^2 + 40400^2 &= 102010004^2 \\
 1020302009996^2 + 4040400^2 &= 1020302010004^2 \\
 10203040302009996^2 + 404040400^2 &= 10203040302010004^2 \\
 102030405040302009996^2 + 40404040400^2 &= 102030405040302010004^2 \\
 1020304050605040302009996^2 + 4040404040400^2 &= 1020304050605040302010004^2 \\
 10203040506070605040302009996^2 + 404040404040400^2 &= 10203040506070605040302010004^2 \\
 102030405060708070605040302009996^2 + 40404040404040400^2 &= 102030405060708070605040302010004^2 \\
 1020304050607080908070605040302009996^2 + 40404040404040400^2 &= 1020304050607080908070605040302010004^2 \quad (3.2)
 \end{aligned}$$

$$\begin{aligned}
 009991^2 + 600^2 &= 10009^2 \\
 102009991^2 + 60600^2 &= 102010009^2 \\
 1020302009991^2 + 6060600^2 &= 1020302010009^2 \\
 10203040302009991^2 + 606060600^2 &= 10203040302010009^2 \\
 102030405040302009991^2 + 60606060600^2 &= 102030405040302010009^2 \\
 1020304050605040302009991^2 + 6060606060600^2 &= 1020304050605040302010009^2 \\
 10203040506070605040302009991^2 + 606060606060600^2 &= 10203040506070605040302010009^2 \\
 102030405060708070605040302009991^2 + 60606060606060600^2 &= 102030405060708070605040302010009^2 \\
 1020304050607080908070605040302009991^2 + 60606060606060600^2 &= 1020304050607080908070605040302010009^2 \quad (3.3)
 \end{aligned}$$

$$\begin{aligned}
 &009984^2 + 800^2 &&= 10016^2 \\
 &102009984^2 + 80800^2 &&= 102010016^2 \\
 &1020302009984^2 + 8080800^2 &&= 1020302010016^2 \\
 &10203040302009984^2 + 808080800^2 &&= 10203040302010016^2 \\
 &102030405040302009984^2 + 80808080800^2 &&= 102030405040302010016^2 \\
 &1020304050605040302009984^2 + 8080808080800^2 &&= 1020304050605040302010016^2 \\
 &10203040506070605040302009984^2 + 808080808080800^2 &&= 10203040506070605040302010016^2 \\
 &102030405060708070605040302009984^2 + 80808080808080800^2 &&= 102030405060708070605040302010016^2 \\
 &1020304050607080908070605040302009984^2 + 8080808080808080800^2 &&= 1020304050607080908070605040302010016^2 \quad (3.4)
 \end{aligned}$$

$$\begin{aligned}
 &009975^2 + 1000^2 &&= 10025^2 \\
 &102009975^2 + 10100^2 &&= 102010025^2 \\
 &1020302009975^2 + 1010100^2 &&= 1020302010025^2 \\
 &10203040302009975^2 + 101010100^2 &&= 10203040302010025^2 \\
 &102030405040302009975^2 + 10101010100^2 &&= 102030405040302010025^2 \\
 &1020304050605040302009975^2 + 1010101010100^2 &&= 1020304050605040302010025^2 \\
 &10203040506070605040302009975^2 + 101010101010100^2 &&= 10203040506070605040302010025^2 \\
 &102030405060708070605040302009975^2 + 10101010101010100^2 &&= 102030405060708070605040302010025^2 \\
 &1020304050607080908070605040302009975^2 + 1010101010101010100^2 &&= 1020304050607080908070605040302010025^2 \quad (3.5)
 \end{aligned}$$

$$\begin{aligned}
 &009964^2 + 1200^2 &&= 10036^2 \\
 &102009964^2 + 121200^2 &&= 102010036^2 \\
 &1020302009964^2 + 12121200^2 &&= 1020302010036^2 \\
 &10203040302009964^2 + 1212121200^2 &&= 10203040302010036^2 \\
 &102030405040302009964^2 + 121212121200^2 &&= 102030405040302010036^2 \\
 &1020304050605040302009964^2 + 12121212121200^2 &&= 1020304050605040302010036^2 \\
 &10203040506070605040302009964^2 + 1212121212121200^2 &&= 10203040506070605040302010036^2 \\
 &102030405060708070605040302009964^2 + 121212121212121200^2 &&= 102030405060708070605040302010036^2 \\
 &1020304050607080908070605040302009964^2 + 12121212121212121200^2 &&= 1020304050607080908070605040302010036^2 \quad (3.6)
 \end{aligned}$$

$$\begin{aligned}
 &009951^2 + 1400^2 &&= 10049^2 \\
 &102009951^2 + 141400^2 &&= 102010049^2 \\
 &1020302009951^2 + 14141400^2 &&= 1020302010049^2 \\
 &10203040302009951^2 + 1414141400^2 &&= 10203040302010049^2 \\
 &102030405040302009951^2 + 141414141400^2 &&= 102030405040302010049^2 \\
 &1020304050605040302009951^2 + 14141414141400^2 &&= 1020304050605040302010049^2 \\
 &10203040506070605040302009951^2 + 1414141414141400^2 &&= 10203040506070605040302010049^2 \\
 &102030405060708070605040302009951^2 + 141414141414141400^2 &&= 102030405060708070605040302010049^2 \\
 &1020304050607080908070605040302009951^2 + 14141414141414141400^2 &&= 1020304050607080908070605040302010049^2 \quad (3.7)
 \end{aligned}$$

$$\begin{aligned}
 &009936^2 + 1600^2 &&= 10064^2 \\
 &102009936^2 + 161600^2 &&= 102010064^2 \\
 &1020302009936^2 + 16161600^2 &&= 1020302010064^2 \\
 &10203040302009936^2 + 1616161600^2 &&= 10203040302010064^2 \\
 &102030405040302009936^2 + 161616161600^2 &&= 102030405040302010064^2 \\
 &1020304050605040302009936^2 + 16161616161600^2 &&= 1020304050605040302010064^2 \\
 &10203040506070605040302009936^2 + 1616161616161600^2 &&= 10203040506070605040302010064^2 \\
 &102030405060708070605040302009936^2 + 161616161616161600^2 &&= 102030405060708070605040302010064^2 \\
 &1020304050607080908070605040302009936^2 + 16161616161616161600^2 &&= 1020304050607080908070605040302010064^2 \quad (3.8)
 \end{aligned}$$

$$\begin{aligned}
 &009919^2 + 1800^2 &&= 10081^2 \\
 &102009919^2 + 181800^2 &&= 102010081^2 \\
 &1020302009919^2 + 18181800^2 &&= 1020302010081^2 \\
 &10203040302009919^2 + 1818181800^2 &&= 10203040302010081^2 \\
 &102030405040302009919^2 + 181818181800^2 &&= 102030405040302010081^2 \\
 &1020304050605040302009919^2 + 18181818181800^2 &&= 1020304050605040302010081^2 \\
 &10203040506070605040302009919^2 + 1818181818181800^2 &&= 10203040506070605040302010081^2 \\
 &102030405060708070605040302009919^2 + 181818181818181800^2 &&= 102030405060708070605040302010081^2 \\
 &1020304050607080908070605040302009919^2 + 18181818181818181800^2 &&= 1020304050607080908070605040302010081^2 \quad (3.9)
 \end{aligned}$$

$$\begin{aligned}
 &009900^2 + 2000^2 &&= 10100^2 \\
 &102009900^2 + 202000^2 &&= 102010100^2 \\
 &1020302009900^2 + 20202000^2 &&= 1020302010100^2 \\
 &10203040302009900^2 + 2020202000^2 &&= 10203040302010100^2 \\
 &102030405040302009900^2 + 202020202000^2 &&= 102030405040302010100^2 \\
 &1020304050605040302009900^2 + 20202020202000^2 &&= 1020304050605040302010100^2 \\
 &10203040506070605040302009900^2 + 2020202020202000^2 &&= 10203040506070605040302010100^2 \\
 &102030405060708070605040302009900^2 + 202020202020202000^2 &&= 102030405060708070605040302010100^2 \\
 &1020304050607080908070605040302009900^2 + 20202020202020202000^2 &&= 1020304050607080908070605040302010100^2 \quad (3.10)
 \end{aligned}$$

$$\begin{aligned}
 &009879^2 + 2200^2 &&= 10121^2 \\
 &102009879^2 + 222200^2 &&= 102010121^2 \\
 &1020302009879^2 + 22222200^2 &&= 1020302010121^2 \\
 &10203040302009879^2 + 2222222200^2 &&= 10203040302010121^2 \\
 &102030405040302009879^2 + 222222222200^2 &&= 102030405040302010121^2 \\
 &1020304050605040302009879^2 + 22222222222200^2 &&= 1020304050605040302010121^2 \\
 &10203040506070605040302009879^2 + 2222222222222200^2 &&= 10203040506070605040302010121^2 \\
 &102030405060708070605040302009879^2 + 222222222222222200^2 &&= 102030405060708070605040302010121^2 \\
 &1020304050607080908070605040302009879^2 + 22222222222222222200^2 &&= 1020304050607080908070605040302010121^2 \quad (3.11)
 \end{aligned}$$



$$\begin{aligned}
 &009856^2 + 2400^2 &&= 10144^2 \\
 &102009856^2 + 242400^2 &&= 102010144^2 \\
 &1020302009856^2 + 24242400^2 &&= 1020302010144^2 \\
 &10203040302009856^2 + 2424242400^2 &&= 10203040302010144^2 \\
 &102030405040302009856^2 + 242424242400^2 &&= 102030405040302010144^2 \\
 &1020304050605040302009856^2 + 24242424242400^2 &&= 1020304050605040302010144^2 \\
 &10203040506070605040302009856^2 + 2424242424242400^2 &&= 10203040506070605040302010144^2 \\
 &102030405060708070605040302009856^2 + 242424242424242400^2 &&= 102030405060708070605040302010144^2 \\
 &1020304050607080908070605040302009856^2 + 242424242424242400^2 &&= 1020304050607080908070605040302010144^2
 \end{aligned}
 \tag{3.12}$$

$$\begin{aligned}
 &009831^2 + 2600^2 &&= 10169^2 \\
 &102009831^2 + 262600^2 &&= 102010169^2 \\
 &1020302009831^2 + 26262600^2 &&= 1020302010169^2 \\
 &10203040302009831^2 + 2626262600^2 &&= 10203040302010169^2 \\
 &102030405040302009831^2 + 262626262600^2 &&= 102030405040302010169^2 \\
 &1020304050605040302009831^2 + 26262626262600^2 &&= 1020304050605040302010169^2 \\
 &10203040506070605040302009831^2 + 2626262626262600^2 &&= 10203040506070605040302010169^2 \\
 &102030405060708070605040302009831^2 + 262626262626262600^2 &&= 102030405060708070605040302010169^2 \\
 &1020304050607080908070605040302009831^2 + 262626262626262600^2 &&= 1020304050607080908070605040302010169^2
 \end{aligned}
 \tag{3.13}$$

$$\begin{aligned}
 &009804^2 + 2800^2 &&= 10196^2 \\
 &102009804^2 + 282800^2 &&= 102010196^2 \\
 &1020302009804^2 + 28282800^2 &&= 1020302010196^2 \\
 &10203040302009804^2 + 2828282800^2 &&= 10203040302010196^2 \\
 &102030405040302009804^2 + 282828282800^2 &&= 102030405040302010196^2 \\
 &1020304050605040302009804^2 + 28282828282800^2 &&= 1020304050605040302010196^2 \\
 &10203040506070605040302009804^2 + 2828282828282800^2 &&= 10203040506070605040302010196^2 \\
 &102030405060708070605040302009804^2 + 282828282828282800^2 &&= 102030405060708070605040302010196^2 \\
 &1020304050607080908070605040302009804^2 + 282828282828282800^2 &&= 1020304050607080908070605040302010196^2
 \end{aligned}
 \tag{3.14}$$

$$\begin{aligned}
 &009775^2 + 3000^2 &&= 10225^2 \\
 &102009775^2 + 303000^2 &&= 102010225^2 \\
 &1020302009775^2 + 30303000^2 &&= 1020302010225^2 \\
 &10203040302009775^2 + 3030303000^2 &&= 10203040302010225^2 \\
 &102030405040302009775^2 + 303030303000^2 &&= 102030405040302010225^2 \\
 &1020304050605040302009775^2 + 30303030303000^2 &&= 1020304050605040302010225^2 \\
 &10203040506070605040302009775^2 + 3030303030303000^2 &&= 10203040506070605040302010225^2 \\
 &102030405060708070605040302009775^2 + 303030303030303000^2 &&= 102030405060708070605040302010225^2 \\
 &1020304050607080908070605040302009775^2 + 303030303030303000^2 &&= 1020304050607080908070605040302010225^2
 \end{aligned}
 \tag{3.15}$$

$$\begin{aligned}
 009744^2 + 3200^2 &= 10256^2 \\
 102009744^2 + 323200^2 &= 102010256^2 \\
 1020302009744^2 + 32323200^2 &= 1020302010256^2 \\
 10203040302009744^2 + 3232323200^2 &= 10203040302010256^2 \\
 102030405040302009744^2 + 323232323200^2 &= 102030405040302010256^2 \\
 1020304050605040302009744^2 + 32323232323200^2 &= 1020304050605040302010256^2 \\
 10203040506070605040302009744^2 + 3232323232323200^2 &= 10203040506070605040302010256^2 \\
 102030405060708070605040302009744^2 + 323232323232323200^2 &= 102030405060708070605040302010256^2 \\
 1020304050607080908070605040302009744^2 + 32323232323232323200^2 &= 1020304050607080908070605040302010256^2
 \end{aligned}
 \tag{3.16}$$

$$\begin{aligned}
 009711^2 + 3400^2 &= 10289^2 \\
 102009711^2 + 343400^2 &= 102010289^2 \\
 1020302009711^2 + 34343400^2 &= 1020302010289^2 \\
 10203040302009711^2 + 3434343400^2 &= 10203040302010289^2 \\
 102030405040302009711^2 + 343434343400^2 &= 102030405040302010289^2 \\
 1020304050605040302009711^2 + 34343434343400^2 &= 1020304050605040302010289^2 \\
 10203040506070605040302009711^2 + 3434343434343400^2 &= 10203040506070605040302010289^2 \\
 102030405060708070605040302009711^2 + 343434343434343400^2 &= 102030405060708070605040302010289^2 \\
 1020304050607080908070605040302009711^2 + 34343434343434343400^2 &= 1020304050607080908070605040302010289^2
 \end{aligned}
 \tag{3.17}$$

$$\begin{aligned}
 009676^2 + 3600^2 &= 10324^2 \\
 102009676^2 + 363600^2 &= 102010324^2 \\
 1020302009676^2 + 36363600^2 &= 1020302010324^2 \\
 10203040302009676^2 + 3636363600^2 &= 10203040302010324^2 \\
 102030405040302009676^2 + 363636363600^2 &= 102030405040302010324^2 \\
 1020304050605040302009676^2 + 36363636363600^2 &= 1020304050605040302010324^2 \\
 10203040506070605040302009676^2 + 3636363636363600^2 &= 10203040506070605040302010324^2 \\
 102030405060708070605040302009676^2 + 363636363636363600^2 &= 102030405060708070605040302010324^2 \\
 1020304050607080908070605040302009676^2 + 36363636363636363600^2 &= 1020304050607080908070605040302010324^2
 \end{aligned}
 \tag{3.18}$$

$$\begin{aligned}
 009639^2 + 3800^2 &= 10361^2 \\
 102009639^2 + 383800^2 &= 102010361^2 \\
 1020302009639^2 + 38383800^2 &= 1020302010361^2 \\
 10203040302009639^2 + 3838383800^2 &= 10203040302010361^2 \\
 102030405040302009639^2 + 383838383800^2 &= 102030405040302010361^2 \\
 1020304050605040302009639^2 + 38383838383800^2 &= 1020304050605040302010361^2 \\
 10203040506070605040302009639^2 + 3838383838383800^2 &= 10203040506070605040302010361^2 \\
 102030405060708070605040302009639^2 + 383838383838383800^2 &= 102030405060708070605040302010361^2 \\
 1020304050607080908070605040302009639^2 + 38383838383838383800^2 &= 1020304050607080908070605040302010361^2
 \end{aligned}
 \tag{3.19}$$

$$\begin{aligned}
 &009600^2 + 4000^2 &&= 10400^2 \\
 &102009600^2 + 404000^2 &&= 102010400^2 \\
 &1020302009600^2 + 40404000^2 &&= 1020302010400^2 \\
 &10203040302009600^2 + 4040404000^2 &&= 10203040302010400^2 \\
 &102030405040302009600^2 + 404040404000^2 &&= 102030405040302010400^2 \\
 &1020304050605040302009600^2 + 40404040404000^2 &&= 1020304050605040302010400^2 \\
 &10203040506070605040302009600^2 + 4040404040404000^2 &&= 10203040506070605040302010400^2 \\
 &102030405060708070605040302009600^2 + 404040404040404000^2 &&= 102030405060708070605040302010400^2 \\
 &1020304050607080908070605040302009600^2 + 40404040404040404000^2 &&= 1020304050607080908070605040302010400^2
 \end{aligned} \tag{3.20}$$

... ..  
 ... ..

$$\begin{aligned}
 &000199^2 + 19800^2 &&= 19801^2 \\
 &102000199^2 + 1999800^2 &&= 102019801^2 \\
 &1020302000199^2 + 199999800^2 &&= 1020302019801^2 \\
 &10203040302000199^2 + 19999999800^2 &&= 10203040302019801^2 \\
 &102030405040302000199^2 + 1999999999800^2 &&= 102030405040302019801^2 \\
 &1020304050605040302000199^2 + 199999999999800^2 &&= 1020304050605040302019801^2 \\
 &10203040506070605040302000199^2 + 19999999999999800^2 &&= 10203040506070605040302019801^2 \\
 &102030405060708070605040302000199^2 + 1999999999999999800^2 &&= 102030405060708070605040302019801^2 \\
 &1020304050607080908070605040302000199^2 + 19999999999999999800^2 &&= 1020304050607080908070605040302019801^2
 \end{aligned} \dots \tag{3.99}$$

**Remark 1.** We observe the last number in each row of **Third Group** is a perfect square, for example,

$$01 = 1^2, 04 = 2^2, 09 = 3^2, \dots, 9801 = 99^2.$$

We have written 20 patterned triples in a sequence and last equation is 99. We can go further, but the first row don't follow the same pattern. For more details refer author's work [4]

For connections of Pythagorean triples with magic squares see author's another work [3].

## References

- [1] R. KNOTT, Pythagorean Right-Angled Triangles, <http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Pythag/pythag.html>.
- [2] Pythagorean triple - Wikipedia, <https://goo.gl/Zwu7sC>
- [3] I.J. TANEJA, Pythagorean Triples and Perfect Square Sum Magic Squares, RGMIA Research Report Collection, **20**(2017), Art. 128, pp. 1-22, <http://rgmia.org/papers/v20/v20a128.pdf> or <https://inderjtaneja.com/2017/09/14/perfect-square-sum-magic-squares/>
- [4] I.J. TANEJA, Patterned Pythagorean Triples, RGMIA Research Report Collection, **21**(2018), <http://rgmia.org/v21.php>