

Magic Square Of Squares Search

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We have determined that, for the following central squares, there are no 3×3 magic squares with distinct entries with at least 7 squares (besides symmetries and k^2 multiples of the known one). All primes factors considered are of the form $p \equiv 1(4)$. Note if there is no such magic square with central square x^2 then no square factor of x^2 is the central square of such a square (e.g. since $(13*17)^{100}$ is not the central square of such a square, neither is $13^2 17^{80}$ or $13^{92} 17^{40}$, etc.).

The search continues. Software (including source) for performing such a search is available for download (get it at <http://london314.brinkster.net/MagicSearcher.msi> – it is currently Windows-only since Mono does not support mixed mode assemblies) and a distributed computing project is in the works. The actual computational engine has been partitioned out into a .NET Assembly called MagicLibrary that can be easily used in other search applications. Please improve the code and send it back!

All Configurations

Two Distinct Prime Factors

- $(p_1 p_2)^4$ with $13 \leq p_1 < p_2 \leq 99989$.
- $(p_1 p_2)^8$ with $5 \leq p_1 \leq 149$ and $5 \leq p_2 \leq 10,000,000$
- $(p_1 p_2)^{10}$ with $13 \leq p_1 < p_2 \leq 9949$.
- $(p_1 p_2)^{14}$ with $13 \leq p_1 < p_2 \leq 1993$.
- $(p_1 p_2)^{24}$ with $13 \leq p_1 < p_2 \leq 977$.
- $(p_1 p_2)^{50}$ with $13 \leq p_1 < p_2 \leq 89$.
- $(p_1 p_2)^{100}$ with $13 \leq p_1 < p_2 \leq 17$.

Three Distinct Prime Factors

- $(p_1 p_2 p_3)^4$ with $13 \leq p_1 < p_2 < p_3 \leq 4973$.
- $(p_1 p_2 p_3)^6$ with $13 \leq p_1 < p_2 < p_3 \leq 1993$.
- $(5 p_2 p_3)^8$ with $13 \leq p_2 \leq 61$ and $5 \leq p_3 \leq 100,000$
- $(p_1 p_2 p_3)^{10}$ with $13 \leq p_1 < p_2 < p_3 \leq 457$.
- $(p_1 p_2 p_3)^{16}$ with $13 \leq p_1 < p_2 < p_3 \leq 89$.

Four Distinct Prime Factors

$(p_1 p_2 p_3 p_4)^4$ with $13 \leq p_1 < p_2 < p_3 < p_4 \leq 457$.
 $(p_1 p_2 p_3 p_4)^6$ with $13 \leq p_1 < p_2 < p_3 < p_4 \leq 89$.

Five Distinct Prime Factors

$(p_1 p_2 p_3 p_4 p_5)^2$ with $13 \leq p_1 < p_2 < p_3 < p_4 < p_5 \leq 457$.
 $(p_1 p_2 p_3 p_4 p_5)^4$ with $13 \leq p_1 < p_2 < p_3 < p_4 < p_5 \leq 89$.

Six Distinct Prime Factors

$(p_1 p_2 p_3 p_4 p_5 p_6)^2$ with $5 \leq p_1 < p_2 < p_3 < p_4 < p_5 < p_6 \leq 89$.

Seven Distinct Prime Factors

$(p_1 p_2 p_3 p_4 p_5 p_6 p_7)^2$ with $5 \leq p_1 < p_2 < p_3 < p_4 < p_5 < p_6 < p_7 \leq 53$.

Hourglass Configuration

Three Distinct Prime Factors

$(5 p_2 p_3)^8$ with $13 \leq p_2 \leq 113$ and $5 \leq p_3 \leq 10,000,000$