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On the Diophantine equation $7x(x + 1)(x + 2)(x + 3) = 5y(y + 1)(y + 2)(y + 3)$. (Chinese. English summary) Zbl 07404468


Summary: Based on the basic solution of Pell Equation, recursive sequence and congruence theory and other elementary methods, we proved that the Diophantine Equation $Mx(x + 1)(x + 2)(x + 3) = Ny(y + 1) + (y + 2)(y + 3)$ with $(M, N) = (7, 5)$ has a unique positive integer solution, $(x, y) = (10, 11)$. At the same time, we give all integer solutions to the Diophantine equation $x^2 - 35(y^2 + 3y + 1)^2 = 14$.

MSC:

11D25 Cubic and quartic Diophantine equations

Keywords:

Diophantine equation; Pell equation; recursive sequence; positive integer solution