

ON THE SUM OF A SQUARE AND A CUBE

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An asymptotic formula is obtained for the number of solutions of

$$y_1^2 + x_1^2 = y_2^2 + x_2^3$$

with $x_j \leq n^{1/2}$, $y_j \leq n^{1/3}$ and $x_1 \neq x_2$ which corresponds precisely to the contribution from the natural major arcs in the Hardy-Littlewood method.