Answer on Question #75938 – Math – Calculus

Question

Write an odd natural number as a sum of two integers 1m and 2m in a way that 21mm is maximum.

Solution

Let $n = m_1 + m_2$,

$m_1 m_2 = m_1(n - m_1) = nm_1 - m_1^2$.

The maximum value is $m_1 m_2 = \frac{n^2}{4}$ when $m_1 = \frac{n}{2}$ because the coefficient beside m_1^2 is equal to -1 and the maximum value is attained at the vertex.

But since n is odd and m_1 is integer, $m_1 = \frac{n+1}{2}, \quad m_2 = \frac{n-1}{2}$.

Answer: $n = \frac{n+1}{2} + \frac{n-1}{2}$