



Problem of the Week

Problem E

All Square

The positive multiples of 3 from 3 to 2400, inclusive, are each multiplied by the same positive integer, n . All of the products are then added together and the resulting sum is a perfect square.

Determine the value of the smallest positive integer n that makes this true.

$$3, 6, 9, \dots, 2400$$

NOTE:

In solving this problem, it may be helpful to use the fact that the sum of the first n positive integers is equal to $\frac{n(n+1)}{2}$.

That is,

$$1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}$$

For example, $1 + 2 + 3 + 4 + 5 = 15$, and $\frac{5(6)}{2} = 15$.

Also, $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 36$, and $\frac{8(9)}{2} = 36$.
