



Problem of the Week

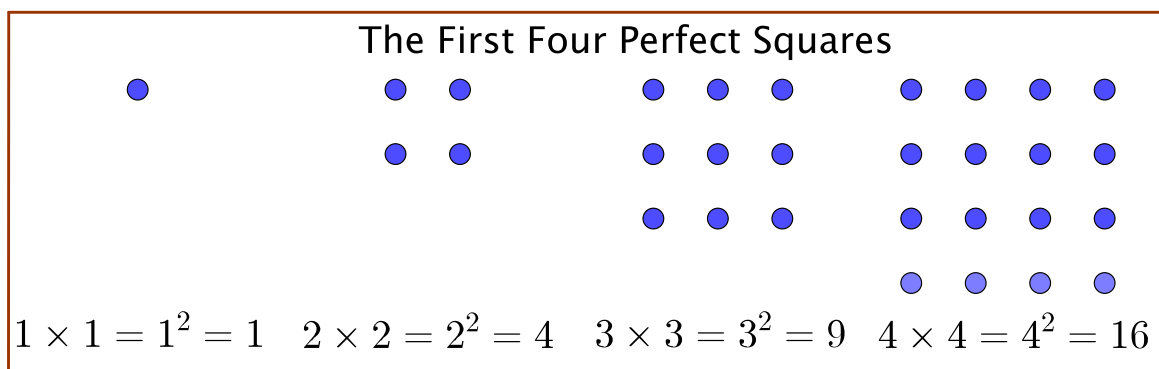
Problem D

This Number Makes It Perfect

A *perfect square* is an integer that can be expressed as the product of two equal integers. 25 is a perfect square since it can be expressed as the product 5×5 or 5^2 .

The positive even integers 2 to 1600, 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.



Did you know that the sum, S , of the positive integers from 1 to some positive integer n can be calculated using the formula $S = \frac{n \times (n+1)}{2}$. For example,

$$1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = \frac{10 \times 11}{2} = 55.$$

This result may be helpful in the problem although it is not necessary to use the result.

