but 25 and 710 are not. Show that there are only finitely many balanced numbers.

4. Consider a 100 x 100 checkerboard consisting of 10,000 unit squares.

5. Define the Fibonacci sequence by $F_1 = 1$, $F_2 = 1$, and $F_{n+2} = F_n + F_{n+1}$ for $n \geq 1$.

6. Define a positive integer to be balanced if the number of its decimal digits equals

the number of its distinct prime divisors. (For example, 12, 21, 105 are all balanced."

Show that there is a Fibonacci number that is divisible by 100.

\begin{itemize}
  \item \text{(a)} Show that if $l$, instead of a 2x2 square is removed from the lower left corner, then
  
  the remaining board cannot be tiled in this way.
  
  \text{(b)} Show that if, instead, a 2x2 square is removed from the lower left corner, then
  
  the remaining board can be tiled with a sufficient number of 3x3 sized-tiles.
\end{itemize}

3. Let $N$ denote the positive integers. A function $f : \mathbb{N} \rightarrow \mathbb{N}$ satisfies

and minute hands of a clock are perpendicular to each other.

2. What are the two times between noon (12:00 P.M.) and 1:00 P.M. that the hour

hands and minute hands of a clock are perpendicular to each other.

1. Mathew noticed that his age, that of his three children, and that of his mother

have different ages.)

MATTHEW is a divisor of 2013. What is the sum of their ages? (All the children

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