1. Find a closed formula that generates each of the following sequences.
   
   A. 4, 7, 12, 19, 28, 39, 52, 67, 84, 103, . . .

   B. 7, 13, 25, 49, 97, 193, 385, 769, 1537, 3073

2. Is the set of positive perfect squares $S = \{1, 4, 9, 16, \ldots\}$ countable? Prove your answer.

3. Find the product $AB$, where

   \[
   A = \begin{bmatrix}
   0 & -1 \\
   7 & 2 \\
   -4 & -3 
   \end{bmatrix} \quad B = \begin{bmatrix}
   4 & -1 & 2 & 3 & 0 \\
   -2 & 0 & 3 & 4 & 1 
   \end{bmatrix}
   \]