1. What is the sum of all two digit numbers? What is the sum of all four digit numbers?

2. Is 12,345,654,321 a perfect square? What about 100,000,000,000? Explain why or why not, and give the square root if it is a whole number.

3. What is the largest number of pieces into which you can cut a rectangular sheet of paper with three straight lines? With four?

4. Which is bigger: $10^{1,000,000}$ or $1,000,000^{10}$? How do you know? Is there a general principle here?

5. In the game of Hi-Q, you have a square grid of holes. There are pegs in some of the holes. A peg can jump over an immediately adjacent one (left, right, up, or down) into the hole immediately beyond, if that hole is unoccupied. The jumped peg is then removed from the board. Imagine you have an infinite square grid and a horizontal line. You may place pegs wherever you wish below the line but no pegs can start out above the line. Your goal is to get a peg as far above the line as possible, by a series of jumps. Is there any limit to how far it can go?