Digital Delirium

1. **Maximizing Products**

   (a) Using all nonzero digits each once, build two numbers A and B so that $A \cdot B$ is as large as possible.

   (b) Using all nonzero digits each once, build three numbers A, B and C so that $A \cdot B \cdot C$ is as large as possible.

   (c) Using all nonzero digits each once, build four numbers A, B, C and D so that $A \cdot B \cdot C \cdot D$ is as large as possible.

   (d) If we build five two-digit numbers using each of the digits 0 through 9 exactly once, and the product of the five numbers is maximized, find the greatest number among them.

2. **Calling All Digits**

   (a) Using each nonzero digit exactly once, create three 3-digit numbers A, B, and C, such that $A + B = C$.

   (b) Again using each nonzero digit exactly once, create three 3-digit numbers A, B, and C that are in the ratio $1 : 3 : 5$.

   (c) Again using each nonzero digit exactly once, create three 3-digit numbers A, B, and C that are in the ratio $1 : 2 : 3$.

   (d) Again using each nonzero digit exactly once, create three 3-digit numbers A, B, and C that are in the ratio $4 : 5 : 6$.

   (e) Again using each nonzero digit exactly once, create three 3-digit numbers A, B, and C that are in the ratio $3 : 7 : 8$.

   (f) Are there any more single digit ratios $a : b : c$ for which the nine nonzero digits can be used to build three numbers A, B, and C in the ratio $a : b : c$.

   (g) Using the ten digits each exactly once, create 3 numbers A, B, and C, such that $A + B = C$.