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 $A + B = C$. 