Problem of the Week #1
8/22/2016 to 9/04/2016

One can consider the 3-by-3 arrangements of the digits 1 through 9 that represent a sum, such as the following.

\[
\begin{array}{c}
\ 318 \\
+ \ 654 \\
\hline \\
972 \\
\end{array}
\]

Similarly, one can consider the 3-by-3 arrangements of the digits 1 through 9 that form a serial, connected chain when traveling one space at a time, horizontally or vertically. That is, when starting at the 1 and moving a single (up/down or left/right) space at a time, one can visit the 2, then the 3, and so on, until reaching the 9. The following arrangement is an example of such a chain.

\[
\begin{array}{ccc}
1 & 2 & 3 \\
8 & 7 & 4 \\
9 & 6 & 5 \\
\end{array}
\]

Find all 3-by-3 arrangements that both represent a sum and form such a chain, or prove that no such arrangement exists.

Solutions for this problem can be submitted to Dr. Brian Miceli at bmiceli@trinity.edu, or you can drop them off at his office, MMH 115F. People with correct solutions will be acknowledged on the next problem. For old problems, follow the “Problem of the Week” link at www.trinity.edu/bmiceli, and if you like these problems, you may be interested in the Putnam Exam. More information on the Putnam Exam can also be found at www.trinity.edu/bmiceli.