Puzzle of the Week
Extreme Products – 2

THE CHALLENGE: 1) Using the digits from 1 to 9, each at most once, make two 3-digit numbers whose product is as large as possible. 2) Also, using the digits from 1 to 9, each at most once, make two 3-digit numbers whose product is as small as possible.

1 2 3 4 5 6 7 8 9

EXPLORATION: Can you apply what you learned for multiplying two numbers to do this with multiplying three 3-digit numbers? Can you think of other interesting variations?

Puzzle of the Week

Extreme Products – 2 – Notes

THE CHALLENGE: Each higher order place has a much larger effect than the lower order places.

To make the product large we will want 8 and 9 for the hundreds place, 6 and 7 for the tens place, and 4 and 5 in the ones place. Some experimentation reveals that 964 x 875 gives the maximum value of 843,500.

Similar logic for making the product small produces the answer 135 x 246 = 33,210.

EXPLORATION: For three numbers, the analysis is similar, though there are a lot of possibilities.

For making the product large, the trend has been to make the numbers associated with 9 smaller and the ones associated with 7 larger. That produces 941 x 852 x 763 = 611,721,516, which is the answer.

Similarly, to make the product small, make the numbers associated with 1 larger and the ones associated with 3 smaller. That produces 147 x 258 x 369 = 13,994,694, which is the answer.