Solution to Problems ♠-8

**Problem A:** *Draw the graph of the function*

\[ y = x^{x^x} \]

*for* \(0 < x < 1\). (Use Maple or any other software)

**Answer:** Let

\[ y = f(x) = x^{x^x} \]

If \(f(x)\) exists then it satisfies the equation \(y = x^y\) or \(\ln y = y \ln x\), and thus, we have \(x = y^{\frac{1}{y}}\). The inverse function of \(f(x)\) is the function \(f^{-1}(x) = x^{\frac{1}{x}}\). We can sketch the curve \(y = x^{\frac{1}{x}}\) on the interval \((0,1)\) and then we reflect the graph about the line \(y = x\) to get the graph of \(f(x)\).

**Correct solutions were received from:**

(1) Brad Tuttle

POW 8A: ♠
Problem B: Let $n$ and $m$ be integer numbers. Prove that, if $3n + 7m$ is divisible by 19, then the number $43n + 75m$ is divisible by 19 also.

Answer: Let $3n + 7m$ be divisible by 19. Then $43n + 75m = 8(3n + 7m) + 19(n + m)$ and it is also divisible by 19.

Correct solutions were received from:

(1) Brad Tuttle