UNIVERSITY OF WISCONSIN
PLATTEVILLE
DEPARTMENT OF MATHEMATICS

Problem of the Week #10

(Fall 2022)

Define $F(x, y) = x + y + x^2y + xy^2 + x^3y^2 + x^2y^3 + x^4y^3 + x^3y^4 + \dots$.

Show that if x, y, and z are real numbers with absolute values less than $\sqrt{2} - 1$, then $F(x, F(y, z)) = F(F(x, y), z)$.

[Please fully explain your answer.]

Email solutions to `kwonmi@uwplatt.edu` by 4:00pm on Wednesday, November 23, 2022.

Every week, the best solution submitted earns a $10 Platteville gift certificate; the top scorer each semester also wins a cash award. Good luck!
You can always see the Problem of the Week (and complete rules) online at:

`http://uwpmath.weebly.com/`