PROBLEM OF THE MONTH #1

FEBRUARY 2019

Open to all students whose mathematics classes come solely from the following list: Math 92, Math 105, Math 151, Math 161, Math 162, Math 163, Math 165, Math 177, Math 287, Math 185, Math 241, or Math 277 or their equivalent.

Directions: Write a complete solution to the problem below showing all work. Your paper must have your name, W#, and Southeastern email address. Solutions are to be placed in the envelope for Problem #1 located in the Department of Mathematics Office, Fayard 308 by 4:30 p.m., **Thursday, February 28**. No late papers will be accepted.

All papers with a correct solution will be entered in a drawing for a great prize!

Questions concerning the problem of the month should be sent to either Dr. Tilak de Alwis (tdealwis@selu.edu), Dr. Randy Wills (rwills@selu.edu) or Dr. Dennis Merino (dmerino@selu.edu)

PROBLEM: Irrational Rationalization

Many have been taught that one should never have a radical in the denominator of a fraction. That is, all denominators should be rationalized. To rationalize a denominator, one must multiply the numerator and the denominator by the same quantity, so as to eliminate all radicals in the denominator.

(a) Rationalize the denominator of the fraction $\frac{1}{\sqrt{2}+\sqrt{3}+\sqrt{5}}$.

(Hint: Multiply the fraction by $\frac{\sqrt{2}-\sqrt{3}-\sqrt{5}}{\sqrt{2}-\sqrt{3}-\sqrt{5}}$)

(b) Rationalize the denominator of the fraction $\frac{1}{\sqrt{2}+\sqrt{3}+\sqrt{5}+\sqrt{7}}$

(Hint: Multiply the fraction by $\frac{\sqrt{2}-\sqrt{3}-\sqrt{5}+\sqrt{7}}{\sqrt{2}-\sqrt{3}-\sqrt{5}+\sqrt{7}}$)