Problems of the Month

Spring 2019

General Problem:

In 2017 Alice was hired by Initech with a wage of $15/hour. In 2018 she received a 10% raise after an exemplary performance evaluation. However, in 2019 Initech was facing financial difficulty and cut her salary by 10%. How much does she earn today?

(Hint: It's not $15/hour!)

Calculus Problem:

Determine whether or not the sequence below converges or diverges.

$$\sum_{n=5}^{\infty} \frac{1}{n \ln(n)}$$

Challenge Problem:

A polygonal rolling-pin n-die has $n-2$ (long) rectangular faces and two regular $n-2$-gons to provide a cap at each end of the rolling pin. A proper coloring of the n-die requires that each face have a color that is different from all of its adjacent faces, edges and vertices; and further that each edge has a color different from all of its adjacent edges and vertices. For each $n > 4$, find $\min(n)$ which is the minimum number of colors needed to provide the n-die a proper coloring.