



PROBLEM OF THE WEEK #2
(Spring 2020)

Prove that for any pair of relatively prime whole numbers x and n , there is some whole number t for which $1 + x + \cdots + x^t$ is a multiple of n .

For example, if $x = 168$ and $n = 25$, we can find $1 + x + x^2 + x^3 = 4,770,025$.

[Please fully explain your answer.]

Solutions should be submitted to Cinda Furry, in Gardner Hall 435, by 4:00 P.M. on Wednesday, February 19, 2020.

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/>