

## PROBLEM OF THE MONTH

DEPARTMENT OF MATHEMTICS  
ELMHURST UNIVERSITY  
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**Problem.** Let  $a_1, a_2, \dots, a_k$  be real numbers, and let  $m_1, m_2, \dots, m_k$  be positive integers. Consider the function

$$f(x) = a_1 \cos(m_1 x) + a_2 \cos(m_2 x) + \cdots + a_k \cos(m_k x).$$

Show that  $f$  has a real root.

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Scan the following QR code for submission instructions.

