University of Colorado
Department of Mathematics
Problem of the Month
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Let A be the set of integers $n \geq 3$ such that it is possible to construct a regular n-gon with straightedge and compass. The set A is infinite, and its first ten elements are $3, 4, 5, 6, 8, 10, 12, 15, 16, 17$.

Question. What is the natural density of the set A?

The **natural density** of a subset $S \subseteq \{1, 2, 3, \ldots\}$ is defined as follows. For each positive integer k, let $s(k) = |S \cap \{1, 2, \ldots, k\}|$ be the number of elements in the interval $[1, k]$ that lie in S. Let $\Delta(k) = s(k)/k$ be the proportion of numbers in the interval $[1, k]$ that lie in S. The natural density of S is $\lim_{k\to\infty} \Delta(k)$, if this number exists.