Problemen

| Problem Section

Problem A (proposed by Jan Turk)

Let $\phi(n)$ denote the Euler totient function. Find the set of limit points of the sequence $\left(\phi(n)/n\right)_{n=1}^{\infty}$.

Problem B

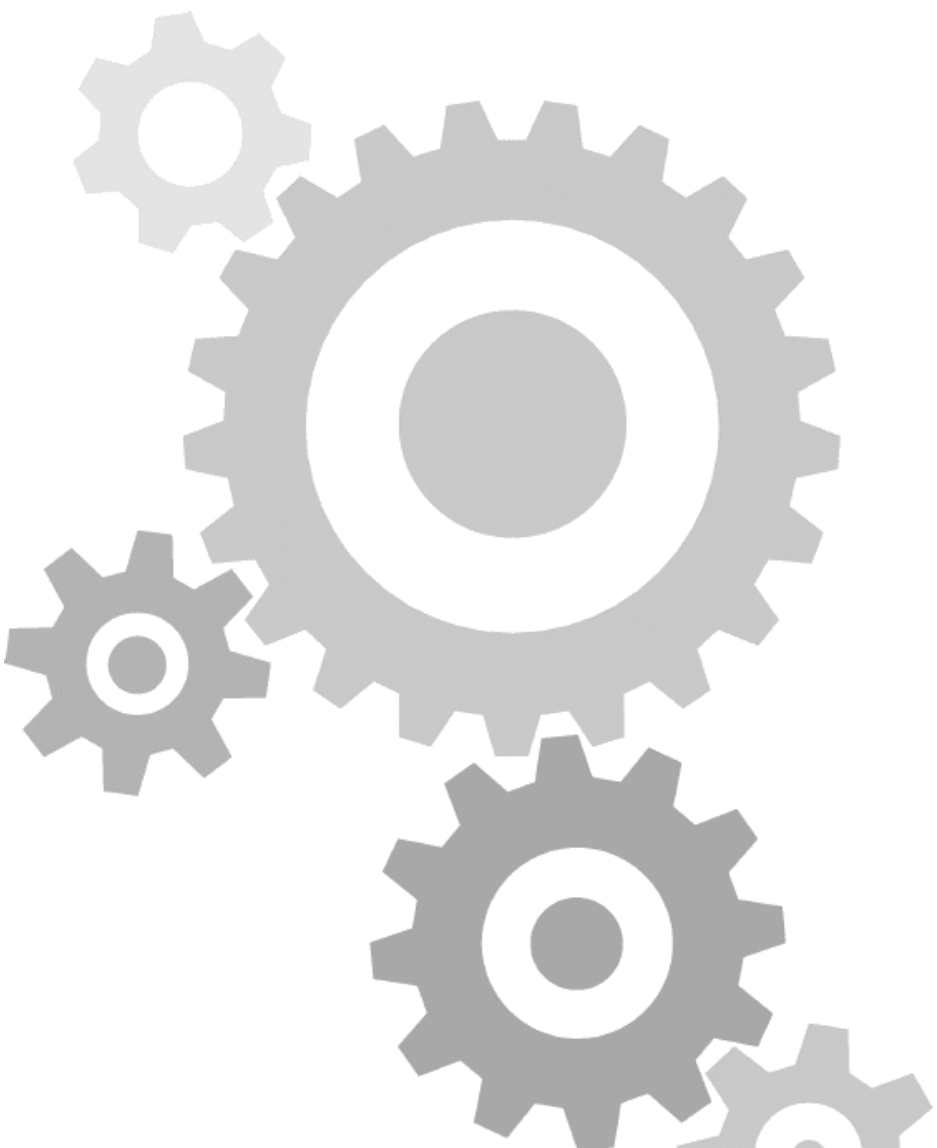
Find nonzero integers c_0, c_1, c_2, c_3 such that the sequence given by $a_1 = 1$, $a_2 = 12$, $a_3 = 68$, $a_4 = 504$, and

$$a_{n+4} = c_0 a_n + c_1 a_{n+1} + c_2 a_{n+2} + c_3 a_{n+3} \quad (n > 0)$$

consists of positive terms and has the property that a_m divides a_n whenever m divides n.

Problem C (proposed by Johannas Winterink)

A circle in $\mathbb{R}^2$ is called *Apollonian* if its centre coordinates and radius are all integers.
Do there exist eleven distinct Apollonian circles A, B, C, $T_1, \ldots, T_8$ such that for $i = 1, \ldots, 8$, the circle T_i is tangent to A, B, and C?



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