Putnam Mathematical Competition

The 2018 Putnam Mathematical Competition will take place on **Saturday, December 1** at 9AM in MSCS 514. This national problem-solving competition is open and free to any OSU undergraduate who registers at MSCS 401 before **Friday, Oct. 12**. Prizes and glory are available. You can also register by emailing
`dosev@okstate.edu` or `wrightd@okstate.edu`.

Past problems from the competition:

1. Given a positive integer n, what is the largest k such that the numbers 1, 2, ... , n can be put in k boxes so that the sum of the numbers in each box is the same?
   [When $n = 8$, the example $\{1, 2, 3, 6\}$, $\{4, 8\}$, $\{5, 7\}$ shows that the largest k is *at least* 3.]

2. Let S be the smallest set of positive integers such that

   a) 2 is in S,

   b) n is in S whenever n^2 is in S, and

   c) $(n + 5)^2$ is in S whenever n is in S.

   Which positive integers are not in S?
   (The set S is "smallest" in the sense that S is contained in any other such set.)

3. Let L_1 and L_2 be distinct lines in the plane. Prove that L_1 and L_2 intersect if and only if, for every real number $\lambda \neq 0$ and every point P not on L_1 or L_2, there exist points A_1 on L_1 and A_2 on L_2 such that $\overrightarrow{PA_2} = \lambda\, \overrightarrow{PA_1}$.

4. Let $a_0 = 1$, $a_1 = 2$, and $a_n = 4a_{n-1} - a_{n-2}$ for $n \geq 2$.
   Find an odd prime factor of a_{2015}.

Later in the fall semester, we will email interested students about meetings where we discuss problem-solving strategies.