

- 1.a. Show that the achievement number of  $K_{1,3}$  is 5.
- b. Find the weak achievement number (Section 5 of Harary's paper) of  $K_3$ . Find a proof sequence for the winning strategy on the minimum number of vertices.
2. Find the value of  $\sum_{i=0}^k (-1)^{k-i} \binom{k}{i} i^n$ . Hint: Let  $A_j = \{f : [n] \rightarrow [k] \mid j \notin \text{ran}(f)\}$  and count surjections.
3. How many ways can we pick 3 corners of a convex  $n$ -gon if we want to avoid corners that are neighbors?