Warm-up (do not turn in): Brualdi #8.11, #8.16, #8.17

Homework:

A. For $n \geq 2$, find a closed formula for:
   
   (a) $S(n, n - 2)$,
   
   (b) $s(n, n - 2)$.

B. In how many ways can $n$ runners finish a race if ties are allowed? Express your answer as a sum involving Stirling numbers of the second kind, and use this formula to evaluate your answer when $n = 5$.

C. Show that for $n \geq 2$, there are the same number of permutations of $[n]$ with an even number of cycles as with an odd number of cycles.

   (Hint: Use the generating function for Stirling numbers of the first kind.)

D. Show that $S(n, k) \leq s(n, k)$ for all positive integers $1 \leq k \leq n$. When does equality hold?