Group Quizlet

Unit: Counting

Date: 12 February, 2019

In groups of up to 3 persons, using your notes and a caculator if preferred, please answer the following 4 problems as well as possible.

1. How many boolean functions $f : \{0,1\}^n \to \{0,1\}$ are there?

2. Let A $= \{1, 2, ..., n\}$. How many subset ordered pairs are there (A_1, A_2) such that $A_1 \subseteq A$; $A_2 \subseteq A$; $A_1 \cap A_2 = \emptyset$

3. In how many ways may 7 distinct flags be mounted on 5 fixed flagpoles? You can put any number of flags on each pole (including 0). The order of the flags on a particular pole does matter in this problem.

4. (Bonus) Prove $(4n)!$ is divisible by $2^{3n} \cdot 3^n$