

- ① FIND THE NUMBER OF 13-CARD BRIDGE HANDS THAT HAVE AT LEAST ONE CARD FROM EACH SUIT.
- ② FIND THE NUMBER OF WAYS TO SELECT 15 BAGELS AT A SHOP THAT HAS 15 PLAIN, 6 BLUEBERRY, 5 CHEESE, AND 3 CINNAMON-RAISIN BAGELS LEFT.
- ③ IF 3 MARRIED COUPLES ARE SEATED AT A ROUND TABLE, FIND THE NUMBER OF ARRANGEMENTS WITH NO COUPLE SITTING TOGETHER.
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- | | | |
|---|---|---|
| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |
- IF EACH SQUARE IN A 3×3 GRID IS COLORED BLUE OR GREEN, FIND THE NUMBER OF WAYS TO COLOR THE SQUARES SO THAT NONE OF THE FOUR 2×2 SQUARES IS ALL GREEN.
- ⑤ A) FIND THE NUMBER OF FUNCTIONS $f: \{1, \dots, 11\} \rightarrow \{1, \dots, 5\}$ WHICH ARE ONTO.
 B) USE PART A) TO FIND THE NUMBER OF WAYS TO BREAK UP $\{1, \dots, 11\}$ INTO 5 NONEMPTY (UNORDERED) SUBSETS.
- ⑥ SUPPOSE 6 SOLDIERS ARE LINED UP IN A ROW. IN HOW MANY WAYS CAN THEY BE REARRANGED SO THAT NO 3 SOLDIERS ARE SIDE-BY-SIDE IN THE SAME ORDER AS BEFORE?