

1. – (ungraded) §6.6 – 3.

2. – (ungraded) §6.6 – 9.

3. – (ungraded) §6.6 – 24b.

4. – §6.6 – 5.

5. – §6.6 – 6.

6. – §6.6 – 11.

7. – §6.6 – 24a.

8. (\mathcal{E}) There are 110 people at the Cornville County Fair. Of these, 60 eat corn dogs, 45 drink corn liquor, 35 wear corny t-shirts, 20 do any two of these activities and 7 do all three. How many people do none of these activities at the fair?

9. (\mathcal{E}) Let

$$a_n = \sum_{k=0}^{\infty} 3^k \cdot \binom{n-k}{k}.$$

Compute a_n for $n = 0, 1, 2, 3, 4, 5$. Find, with proof, constants α and β so that $a_n = \alpha a_{n-1} + \beta a_{n-2}$ for all integers $n \geq 2$.

10. (\mathcal{E}) How many permutations are there of the numbers 1,2,3,4,5,6 so that no number is followed by its immediate successor? (Thus 126453 is not counted but 354621 is counted.) Hint: let A_1 be the set of permutations so that 1 is followed by 2, etc.; look carefully at the sizes of the intersections.