

PROBLEM SET #9

Due Thursday, April 17, 2025 @ 11:59 pm

Submit as single pdf file to Canvas

*Remember to review the **Guidelines for Problem Sets** on the course Webpage!*

1. I'm planning the layout of out the annuals for our flowerbed. In one row, I want to plant 3 dahlias, 4 snapdragons, and 2 petunias. How many different ways can I plant the flowers in the row if:
 - (a) They can be planted in any order
 - (b) All flowers of the same type must be planted next to each other
 - (c) No two flowers of the same type may be planted next to each other
2.
 - (a) If $A = \{a, b, c, d, e, f, g\}$ and $B = \{1, 2, 3, 4, 5, 6, 7\}$, how many functions are there from A to B ? How many of these functions are one-one? How many are onto?
 - (b) If $A = \{a, b, c, d, e, f, g\}$ and $B = \{1, 2, 3, 4\}$, how many functions are there from A to B ? How many of these functions are one-one? How many are onto?
3. Ten students arrive at a testing site to take the SAT. Much to their chagrin, they must all hand over their cellphones to Principal Skinner before entering the room where the exam is administered. How many different ways can Principal Skinner return the cellphones after the exam so that no one receives their own phone? What if there are 15 students who show up to take the exam (and all have cellphones with them)?
4. The intern at the local Dunkin' reports that of the 390 coffee orders it filled on Tuesday, 303 were iced coffee, 211 included a flavored syrup, and 164 used non-dairy milk. In addition, 162 were iced with a flavored syrup, 90 used non-dairy milk and a flavored syrup, 102 were iced with non-dairy milk, and 71 were iced with a flavored syrup and non-dairy milk. Do you trust the intern's numbers?