Recitation 5

Q1: Ms. Jones has 10 books that she is going to put on her bookshelf. Of these, 4 are math books, 3 are chemistry books, 2 are history books, and 1 is a language book.

Ms. Jones wants to arrange her books so that all the books with the same subject are together on the shelf. How many different arrangements are possible?

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4! * 4! * 3! * 2! * 1!

4! (ordering) * 4!(math) * 3!(chem) * 2!(history) * 1!(language)

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(1) 5C2 * 2C3

5C2(choose 2 women from 5) * 7C3(choose 3 men from 7)

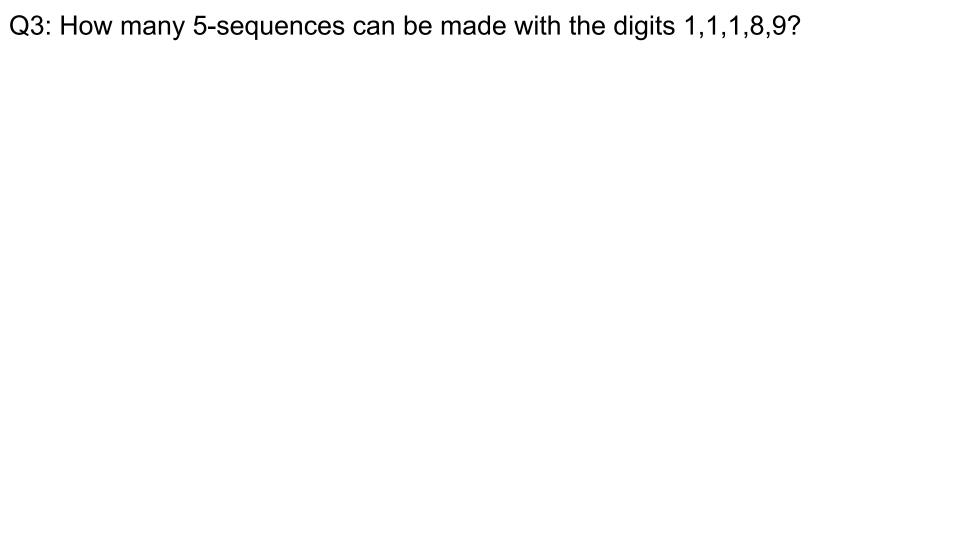
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5C2(choose 2 women from 5) * 7C3(choose 3 men from 7)
(2) 5C2 * 7C3 - 2C2 * 5C1 * 5C2 = 30 * 5C2

(1) 5C2 * 7C3

contradiction: 2C2 (two men together) * 5C1 (choose another man from the remaining 5 men) * 5C2(choose 2 women from 5)



Q3: How many 5-sequences can be made with the digits 1,1,1,8,9?

5P2 * 3C3 = 5!/3!

(select 2 digits(8,9) from 5 digits first, order matters; then select 3 digits(1,1,1) from 3 digits, order does NOT matter)

(optional) Q4: How many 8-sequences can be made with the digits 1,1,2,2,3,3,4,5?

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8C2 * 6C2 * 4P2 * 2C2 = 8!/(2!2!2!)

(optional) Q5: How many 9-sequences can be made with the digits 1,1,1,2,2,3,3,4,5?

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3C9 * 2C6 * 2P4 * 2C2 = 9!/(3!2!2!)