1) U n u s u a l → how many unique subsets of 5 letters (of the 7) exist?

$\binom{4}{4} \cdot \binom{4}{3} \cdot \binom{4}{2}$

→ How many different strings can be made from 5 of these 7 letters?

one n

$5! \cdot (5!/2!\cdot 1!) \cdot (5!/3!\cdot 1!)$

two n three n

2) $\binom{13}{2}\binom{4}{2}\binom{4}{2}\binom{11}{1}\binom{4}{1}$

$\binom{13}{2}$ → chose 2 values that will be pairs

$\binom{4}{2}$ → pick 2/4 suits for the values chosen (1st pair)

$\binom{4}{2}$ → pick 2/4 suits for the values chosen (2nd pair)

$\binom{11}{1}$ → 5th card of another value ($13-2=11$)

$\binom{4}{1}$ → chose 1 suit for the chosen $\binom{11}{1}$ value

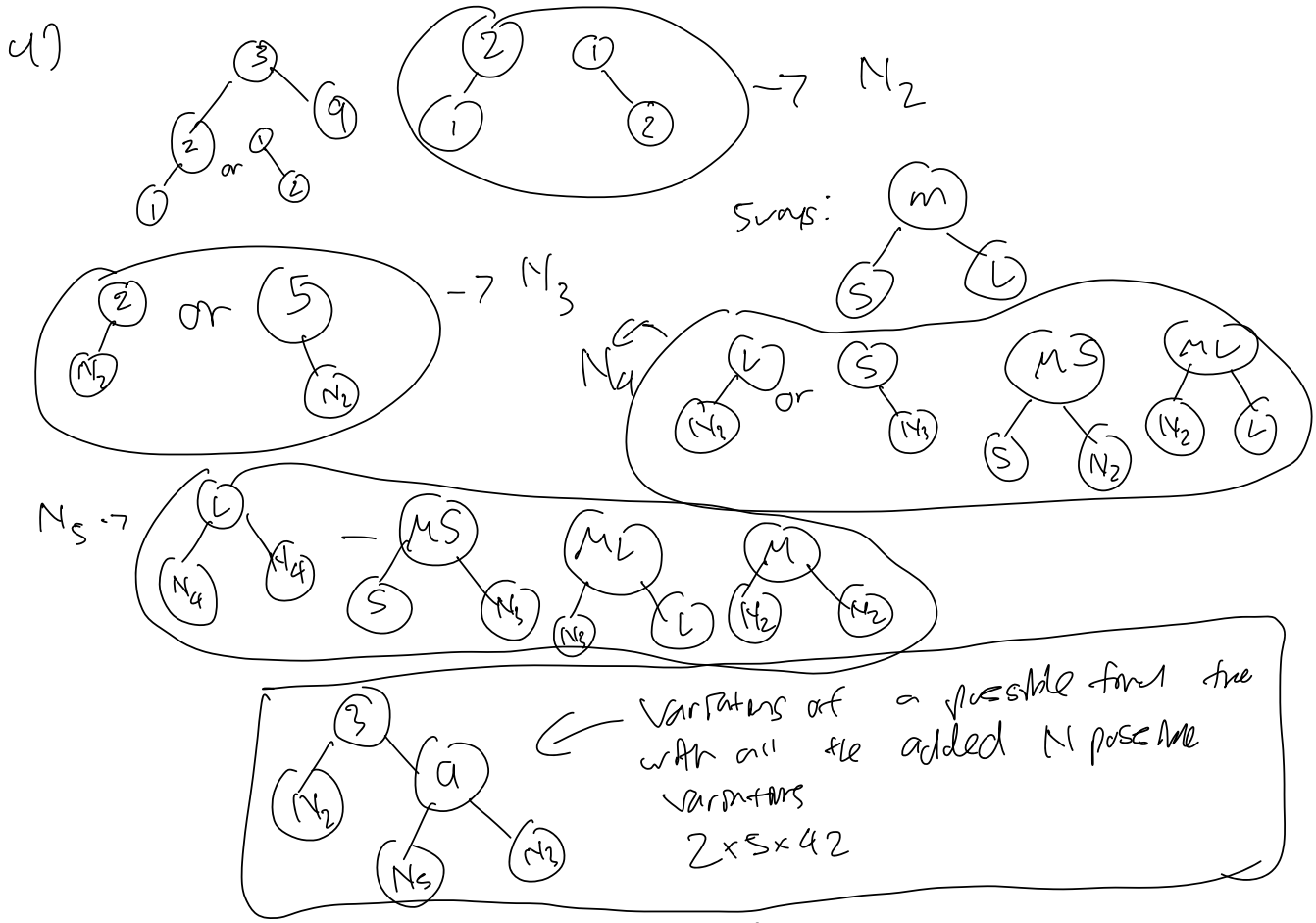
$78 \times 6 \times 6 \times 11 \times 4 = 123,552$

3) $\binom{21}{18} + \binom{20}{15}$

? Right couples = no songs

$6 - 1 + 16 = 21$

4)



5) 9 ways

[7, 1, 1, 1]
[6, 2, 1, 1]
[5, 3, 1, 1]
[4, 4, 1, 1]
[5, 2, 2, 1]
[4, 3, 2, 1]
[3, 3, 3, 1]
[4, 2, 2, 2]
[3, 3, 2, 2]

3 nurses work (8 ways)

[8, 1, 1]
[7, 2, 1]
[6, 3, 1]
[5, 4, 1]
[6, 2, 2]
[5, 3, 2]
[4, 4, 2]
[4, 3, 3]