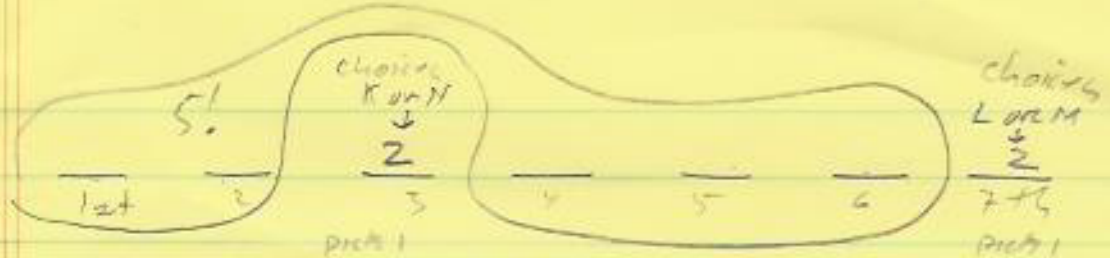
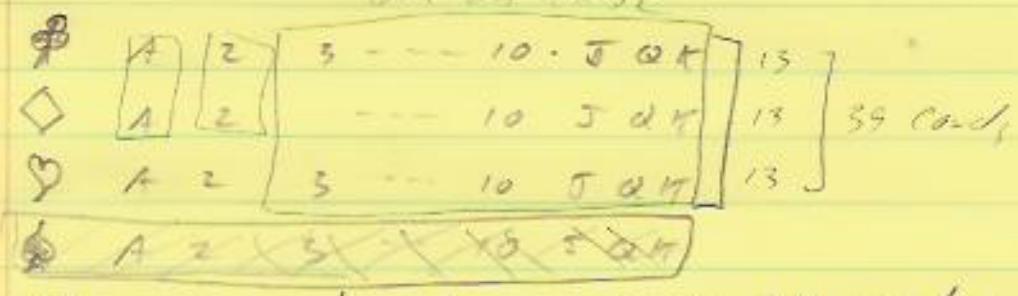
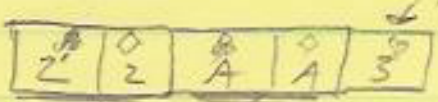
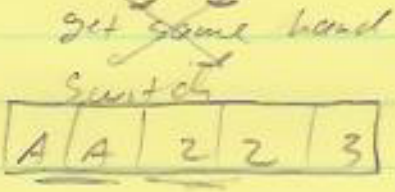
8. 

$N = 2 \cdot 2 \cdot 5!$

9. 

Remove spades leaving $52-13 = 39$ cards in deck.

Sample card hand 



⇒ Process: ① Pick two denominations for two pairs (here I chose 2's and A's) $\binom{13}{2}$

② Pick two aces from 3 ⇒ $\binom{3}{2}$. This eliminates all Aces ⇒ $39-3 = 36$ cards left in deck.

③ Pick two 2's from 3 available $\binom{3}{2}$. This eliminates all 2's leaving $36-3 = 33$ cards in deck.

(Step 4) Pick one card from the 33 remaining cards. 33 choices.

$$P = \frac{\binom{13}{2}\binom{3}{2}\binom{3}{2}\,33}{\binom{52}{5}}$$ (4)

Note: Can also get 33 from $\binom{11}{1}\cdot\binom{3}{1} = 11 \cdot 3 = 33$