2. a. $A = \{LLL, SSS, RRR\}$

B

b. $B = \{LRS, LSR, SLR, SRL, RSL, RLS\}$

c. $C = \{RRS, RRL, RSR, RLR, SRR, LRR\}$

d. $D = \{RRS, RRL, RSR, RLR, SRR, LRR,$
$LLS, LLR, LSL, LRL, SLL, RLL,$
$SSL, SSR, SRS, SLS, LSS, RSS\}$

e. $D' = \{LLL, SSS, RRR, LRS, LSR, SLR, SRL, RSL, RLS\}$

$C \cup D = \{RRS, RRL, RSR, RLR, SRR, LRR, LLS, LLR, LSL, LRL, SLL,$
$RLL, SSL, SSR, SRS, SLS, LSS, RSS\}$

4. a. $S = \{FFFF, VVVV, VFFF, FVFF, FFVF, FFFV, FFVV,$
$FVFV, FVVF, VVFF, FVVV, VFVV, VVFV, VVVF, VFFV,$
$VFVF\}$

b. $\{FFFV, FFVF, FVFF, VFFF\}$

c. $\{FFFF, VVVV\}$

d. $\{FFFF, FFFV, FFVF, FVFF, VFFF\}$

e. $\{FFFF, VVVV, FFFV, FFVF, FVFF, VFFF\}$

$\{FFFF\}$

f. $part(b) \cup part(c) = \{FFFF, VVVV, FFFV, FFVF, FVFF, VFFF\}$

$part(b) \cap part(c) = \emptyset$

30 a. There are $A_3^3 = 3\times2\times1 = 6$ ways to do this

b. There are $C_{30}^6 = \frac{A_{30}^6}{6!} = 593775$ ways to do this

c. There are $C_8^2 C_{10}^2 C_{12}^2 = 83160$ ways to do this

d. The probability is $\frac{C_8^2 C_{10}^2 C_{12}^2}{C_{30}^6} = \frac{1848}{13195}$

e. The probality is $\frac{C_8^6 + C_{10}^6 + C_{12}^6}{C_{30}^6}$

38. a. Let the event be A

The $P(A) = \frac{C_6^2 C_9^1}{C_{15}^3} = \frac{27}{91}$

b. $P = \frac{C_4^3 + C_5^3 + C_6^3}{C_{15}^3} = \frac{34}{455}$

~~b~~ c. Let the event be B

Then $P(B) = \frac{C_6^1 C_5^1 C_4^1}{C_{15}^3} = \frac{24}{91}$

d. Let the event be C

Then $P(C) = 1 - P(C') = 1 - (\frac{9}{15})^5 = 1 - (\frac{3}{5})^5 = \frac{2882}{3125}$

40.

a. Let the number be N

If the A, B, C, D can be distinguishable

Then the $N = 12!$

If not

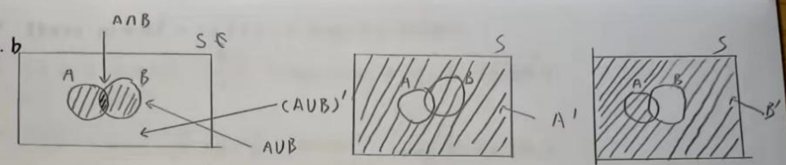
Then the $N = C_{12}^3 \cdot C_9^3 \cdot C_6^3 \cdot$ ~~$C_{16}^4 \cdot C_{12}^4 \cdot C_8^4 \cdot C_4^4$~~

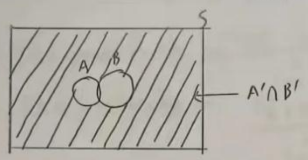
b.

~~$P = \frac{A_4^4}{C_{16}^4 \cdot C_{12}^4 \cdot C_8^4}$~~ $P = \frac{A_4^4}{C_{12}^3 \cdot C_9^3 \cdot C_6^3 \cdot C_3^3}$

9.

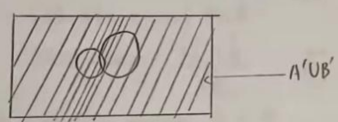
a. b





$\therefore (A\cup B)' = A'\cap B'$

b.



$\therefore (A\cap B)' = A'\cup B'$

225
121
104

12.

a. $P(A\cup B) = P(A)+P(B) - P(A\cap B) = 0.5+0.4-0.25 = 0.65$

b. $P(\text{neither}) = 1 - P(A\cup B) = 1 - 0.65 = 0.35$

c. $P(\text{event}) = P(A) - P(A\cap B) = 0.5 - 0.25 = 0.25$

18. ~~Let~~ Sol: Let the probability of the event be P(A).

Then $P(A) = 1 - P(A') = 1-(\frac{11}{15})^2 = \cancel{\frac{104}{225}}\ \frac{4}{15}$

27. a. The all outcome is { AB, ACo, ACr, AF, BCo, BCr, BF, CoCr, CoF, CrF }

So the probability of $P(AB) = \frac{1}{10}$

b. Let the event be ~~P(B)~~ B

So $P(B) = 1 - P(B') = 1 - \frac{3}{10} = \frac{7}{10}$

c. Let the event be C

Because $14+10 > 14+7 > 14+6 > 14+3 > 10+7 > 10+6 > 15$

So $P(C) = \frac{6}{10} = \frac{3}{5}$