A

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

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

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

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

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

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

$C \cap D = \{RRL, RRS, RLR, RSR, LRR, SRR\} = C$

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

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

c. $\{FFFF, VVVV\}$

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

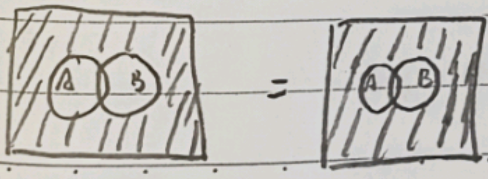
e. Union: $\{FFFF, VVVV, FVFF, VFFF, FFVF, FFFV\}$

intersection: $\{FFFF\}$

f. Union: $\{FFFV, FFVF, FVFF, VFFF, FFFF, VVVV\}$

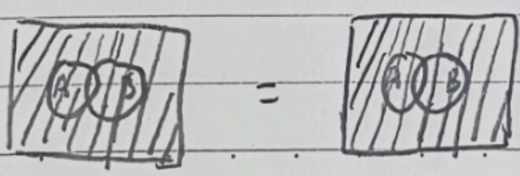
intersection: ϕ

9. a.



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

b.



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

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

b. Let C denotes "the selected individual has neither type of card.
so $P(C) = 1 - P(A \cup B) = 1 - 0.65 = 0.35$.

c. That is $A \cap B'$,

$P(A \cap B') = P(A) - P(A \cap B) = 0.5 - 0.25 = 0.25$

18. Since at least two bulbs must be selected to obtain one that is rated 75W, so it means in the first try we cannot select the 75W bulbs.
Let A denotes "In the first try we select the 75W bulb", we know $P(A) = \frac{4}{15}$
So the probability that at least two attempts to obtain 75W bulb is exactly $P(A') = 1 - \frac{4}{15} = \frac{11}{15}$.

27. a. There're 10 outcomes: {Anderson, Box}, {Anderson, Cox}, {Anderson, Cramer}, {Anderson, Fisher}, {Box, Cox}, {Box, Cramer}, {Box, fisher}, {Cox, Cramer}, {Cox, Fisher}, {Cramer, Fisher}.
So the probability is $\frac{1}{10}$.

b. $\frac{7}{10}$

c. Let A denotes "the two chosen representatives have a total of at least 15 years' teaching experience", so $P(A) = P(\{Anderson, fisher\}) + P(\{Box, Cramer\}) + P(\{Box, fisher\}) + P(\{cox, cramer\}) + P(\{cox, fisher\}) + P(\{Cramer, fisher\}) = 0.6$

2.3 30. a. It's $A_{8,3} = 8\times7\times6 = 336$

b. It's $C_{30,6} = \frac{30\times29\times28\times27\times26\times25}{6\times5\times4\times3\times2\times1} = 593775$

c. It's $C_{8,2}\times C_{10,2}\times C_{12,2} = \frac{8\times7}{2}\times\frac{10\times9}{2}\times\frac{12\times11}{2} = 83160$

d. $p = \frac{83160}{C_{30,6}} = 0.14$.

e. $p = \frac{C_{8,6}+C_{10,6}+C_{12,6}}{C_{30,6}} = 0.002$

38. a. $p = \frac{C_{6,2}C_{9,1}}{C_{15,3}} = \frac{135}{455} = 0.2967$

b. $p = \frac{C_{4,3}+C_{5,3}+C_{6,3}}{C_{15,3}} = \frac{34}{455} = 0.0747$

c. $p = \frac{C_{4,1}C_{6,1}C_{5,1}}{C_{15,3}} = \frac{120}{455} = 0.2637$

d. In this case, the first 5 tries cannot select a 75W bulb, we denote this as A, so $P(A) = \frac{C_{9,5}}{C_{15,5}} = \frac{126}{3003} = 0.042$.

40. a. If they were distinguishable, there're $12!$ such chain molecules.
If the subscripts are removed from the A's, every 6 sample of $12!$ chain become one, so there're $\frac{12!}{6}$ chain molecules.

b. $p = \frac{A_{4,4}}{\frac{12!}{6\times6\times6\times6}} = \frac{24}{369600} = 0.000065$.