

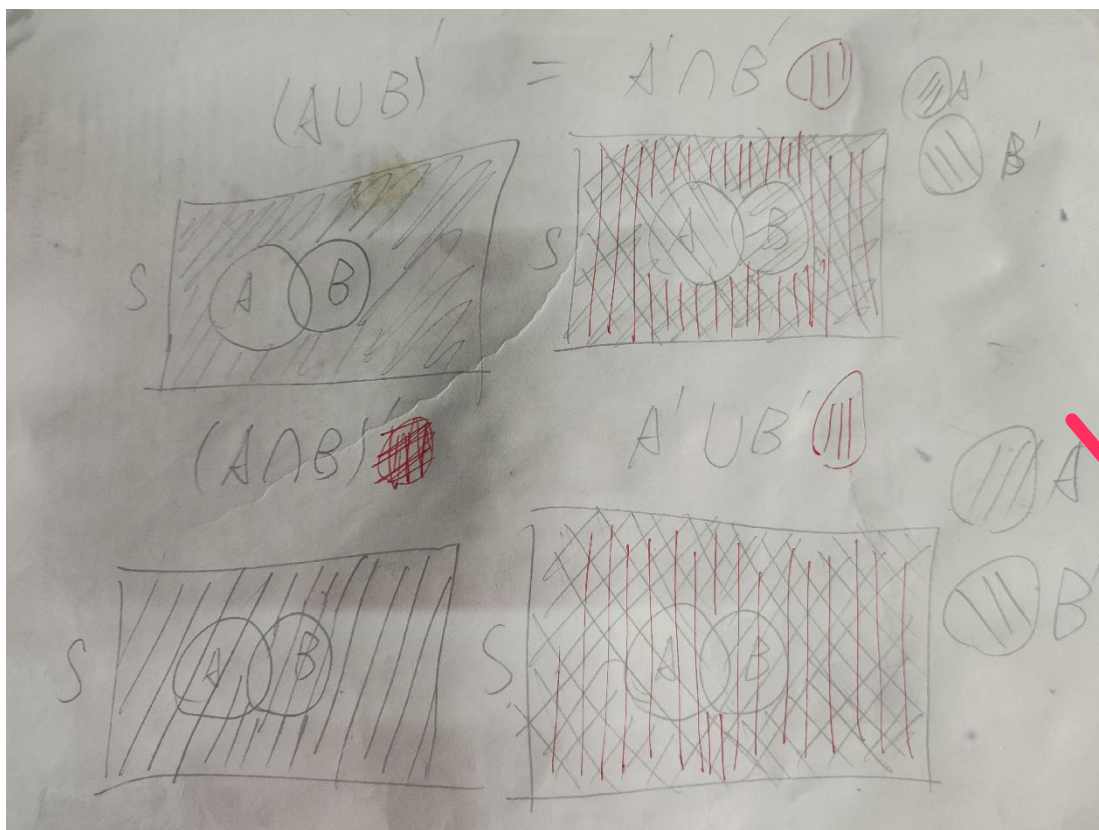
Sec2Ex2.

- a. $A = \{RRR, LLL, SSS\}$ ✓
 b. $B = \{RLS, RSL, LRS, LSR, SLR, SRL\}$ ✗
 c. $C = \{LRR, SRR, RLR, RSR, RRL, RRS\}$
 d. $D = \{LLR, LLS, LRL, LSL, RLL, SLL, RRL, RRS, RLR, RSR, LRR, SRR, SSR, SSL, SRS, SLS, RSS, LSS\}$
 e. $D' = \{RRR, LLL, SSS, RLS, RSL, LRS, LSR, SLR, SRL\}$ ✓
 $C \cup D = D = \{LLR, LLS, LRL, LSL, RLL, SLL, RRL, RRS, RLR, RSR, LRR, SRR, SSR, SSL, SRS, SLS, RSS, LSS\}$
 $C \cap D = C = \{LRR, SRR, RLR, RSR, RRL, RRS\}$ ✓

4.

- a. $S = \{FFFF, FFFV, FFVF, FFVV, FVFF, FVFV, FVVF, FVVV, VFFF, VFFV, VFVF, VFVV, VVFF, VVVF, VVVV\}$
 b. exact 3 fixed mortgages: $\{FFFV, FFVF, FVFF, VFFF\}$
 c. all same type: $\{FFFF, VVVV\}$
 d. at most one of the four is variable: $\{FFFF, FFFV, FFVF, FVFF, VFFF\}$ ✓
 e. (c) and (d) intersection: $\{FFFF\}$ union: $\{FFFF, VVVV, FFFV, FFVF, FVFF, VFFF\}$
 f. (b) and (c) intersection: $\{\}$ union: $\{FFFV, FFVF, FVFF, VFFF, FFFF, VVVV\}$

9.



12.

- a. $P(A \cup B) = P(A) + P(B) - P(A \cap B) = .5 + .4 - .25 = .65$
 b. $1 - P(A \cup B) = .35$
 c. $P(A \cup B) = P(A) - P(A \cap B) = .5 - .25 = .25$ ✓

18.

First we denote selecting a 75W bulb Y and if not 75W for N.

We select bulbs one by one which means every **simple event** is a **sequence** of 4Y and 11N, The **sample space S** contains all sequences in this way which share the **same possibility**.

When at least two bulbs must be selected to obtain one 75W **denoted as A**, it means the first bulb in the sequence is N. Thus its possibility is

$$P(A) = \frac{\binom{14}{3}}{\binom{15}{4}} = \frac{4}{15}$$

27.

a. $P(\text{Anderson and Box selected}) = 1/P(2,5)/2 = 1/10$

b. $P(\text{at least one of the two members whose name beginning with C selected}) = 1 - P(\text{the two is not selected}) = 1 - P(2,3)/P(2,5) = 3/10$

c. At least 15 years' teaching experience compound event consists of $\{\{3,14\}, \{6,14\}, \{7,14\}, \{10,14\}, \{6,10\}, \{7,10\}\}$. The probability is $P(15 \text{ years' teaching}) = 6/P(2,5)/2 = 3/5$

30.

a. $\binom{8}{3} P_{3,3} = 8 \times 7 \times 6 = 336$

b. $\binom{30}{6} = 593775$

c. $\binom{8}{2} \cdot \binom{10}{2} \cdot \binom{12}{2} = 83160$

d. $83160 / \binom{30}{6} = \frac{264}{1885} = 0.14$

e. $\left[\binom{8}{6} + \binom{10}{6} + \binom{12}{6} \right] / 593775 = \frac{28 + 210 + 924}{593775} = \frac{166}{84825} = 0.20\%$

38.

a. $\binom{6}{2} \times 9 / \binom{15}{3} = \frac{27}{91} = 0.30$

b. $P = \left[\binom{4}{3} + \binom{5}{3} + \binom{6}{3} \right] / \binom{15}{3} = \frac{34}{455} = 0.075$

c. $P = 4 \times 5 \times 6 / \binom{15}{3} = \frac{24}{91} = 0.26$

d. That means the first 5 bulbs are not 75W rated.

$$P = \frac{\binom{9}{5}}{\binom{15}{5}} = \frac{6}{143} = 0.042$$

40.

a. $P_{12,12} / (P_{3,3})^4 = 369600$

b. Probability = $P_{4,4} / 369600 = \frac{1}{15400} = 6.5 \times 10^{-5}$