6D #5

(a) $\mu = \frac{4k-2+k+k+1+2k+4+3k}{5} = \frac{11k+3}{5}$

$16k^2 - 16k + 4 + k^2 + k^2 + 2k + 1 + 4k^2 + 16k + 16 + 9k^2$

(b) $\sigma^2 = \frac{(4k-2)^2 + k^2 + (k+1)^2 + (2k+4)^2 + (3k)^2}{5} - \left(\frac{11k+3}{5}\right)^2$

$= \frac{155k^2 + 10k + 105}{25} - \frac{121k^2 + 66k + 9}{25}$

$= \frac{34k^2 - 56k + 96}{25}$

$= \frac{34}{25}k^2 - \frac{56}{25}k + \frac{96}{25}$

(c) $\mu = \frac{11k+3}{5} - 2 = \frac{11k-7}{5}$

(d) no change in σ^2

6E #3. A = tails

B = 3 or more

$P(A) = \frac{1}{2}$

$P(B) = \frac{4}{6} = \frac{2}{3}$

$P(A \cup B) = \frac{\quad}{12} = \frac{5}{6}$

↑ or 10

Addition Rule

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$\frac{1}{2} + \frac{2}{3} - \frac{1}{3} = \frac{5}{6}$$

(d) $P(A \cap B) = \frac{4}{12} = \frac{1}{3}$

(e) $P(A' \cup B) = P(A') + P(B) - P(A' \cap B)$

$$= \frac{1}{2} + \frac{2}{3} - \frac{1}{3} = \frac{5}{6}$$

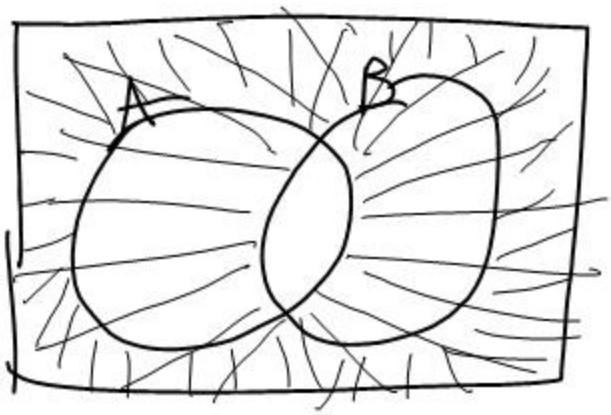
1,1	1,2	1,3	1,4	1,5	1,6
2,1	2,2	2,3	2,4	2,5	2,6
3,1	3,2	3,3	3,4	3,5	3,6
4,1	4,2	4,3	4,4	4,5	4,6
5,1	5,2	5,3	5,4	5,5	5,6
6,1	6,2	6,3	6,4	6,5	6,6

$P(A) = \frac{27}{36} = \frac{3}{4}$ $P(B) = \frac{1}{2}$

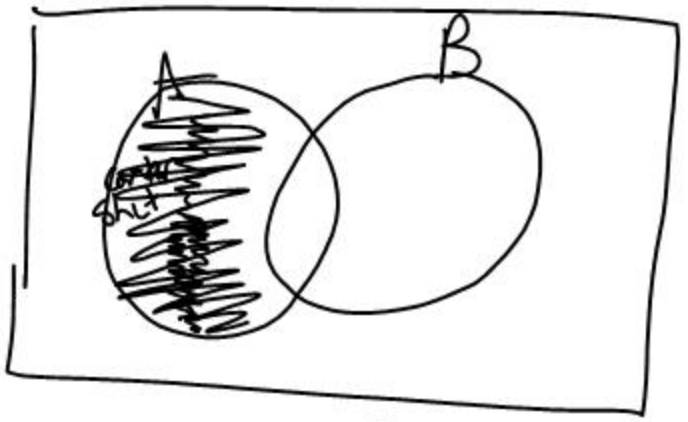
$P(A \cup B) = \frac{27}{36} = \frac{3}{4}$

$P(A \cap B) = \frac{1}{2}$

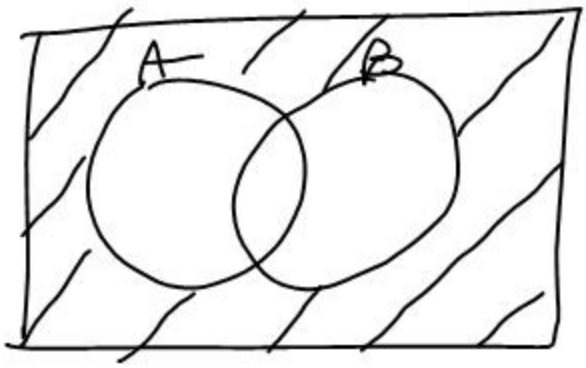
$P(A' \cup B') = \frac{1}{2}$



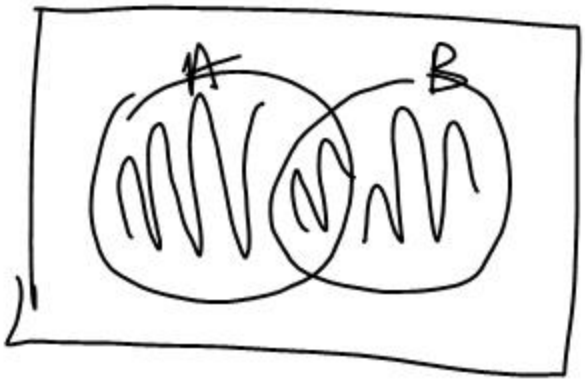
$A' \cup B'$



$A \cap B'$



$A' \cap B'$



$A \cup B$

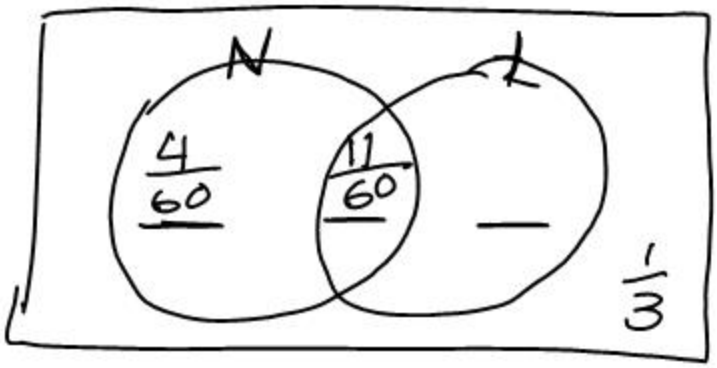
6E #4. N = national paper

L = local paper

$P(N' \cap L') = \frac{1}{3}$

$P(N) = \frac{1}{4}$

$P(L) = \frac{3}{5}$



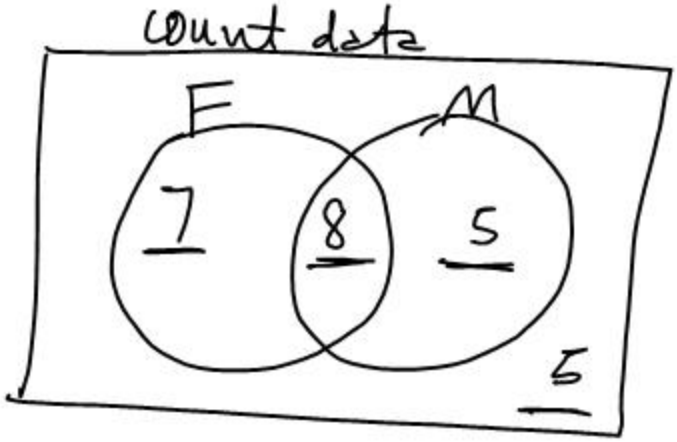
$5\frac{1}{20} + \frac{12}{20}\frac{3}{5} = \frac{17}{20} = \frac{51}{60}$

extra

* $P(N \cap L') = \frac{1}{4} - \frac{11}{60} = \frac{4}{60}$

6F #1

15
13
28



$P(F \cap M) = \frac{8}{25}$

#5. $P(A) = 0.2$

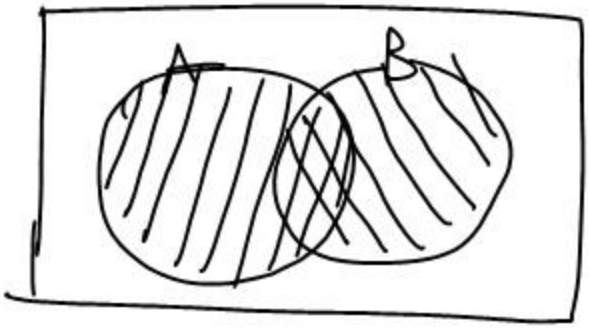
$P(B) = 0.5$

$P(A \cap B) = 0.1$

(a) Find $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= 0.2 + 0.5 - 0.1 = 0.6$

The addition rule



(b) $P(A \cup B)' = 1 - P(A \cup B) = 1 - 0.6 = 0.4$

A and A' are complementary events.

$P(A') = 1 - P(A)$

Quick Review

Ex How many ways are there to arrange 10 students in a row?

$$10 \cdot 9 \cdot 8 \cdots 1 = 10!$$

Ex How many ways are there 4 people out of a set of 10?

$$\binom{10}{4} = \frac{10!}{4!\,(10-4)!} = \frac{10 \cdot 9 \cdot 8 \cdot 7 \cdot \cancel{6!}}{\cancel{4!}\;\cancel{6!}} = 210$$

(3 to choose)

A combination ("choose")

Ex How many ways can we select a P, VP, S, and T from 10 people.

A permutation ("pick")

$$P_4^{10} = \frac{10!}{(10-4)!} = (210)(4!)$$

$$= 5040$$

210
24
840
420

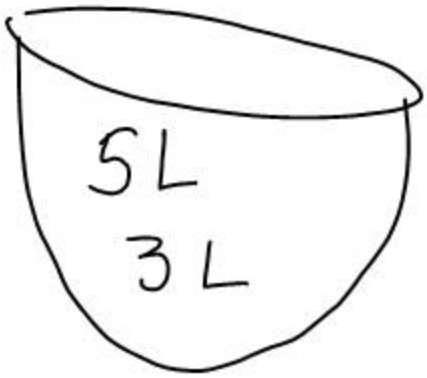
6G #1

$$\frac{\text{number of sample with S \& J}}{\text{size of the sample space}}$$

$$= \frac{\binom{8}{2}}{\binom{10}{4}} = \frac{28}{210} = \frac{14}{105}$$

S, J, —, — $\frac{\cancel{8!}\,\overset{4}{\cancel{8}}\cdot 7}{\cancel{2!}\,\cancel{6!}}$

#2.



(a) $P(2 \text{ limes}) = \frac{\text{number ways to get 2 limes}}{\text{number of ways to get 2 fruits}}$

$$= \frac{\binom{3}{2}}{\binom{8}{2}} = \frac{3}{28}$$

(b) $\frac{(5 \times 3)}{\binom{8}{2}} = \frac{15}{28}$

HW 6F # 2 - 4, 5(c)

6G # 3, 5*

Quiz on probability + μ + σ^2