Probability HW #1

Q.1

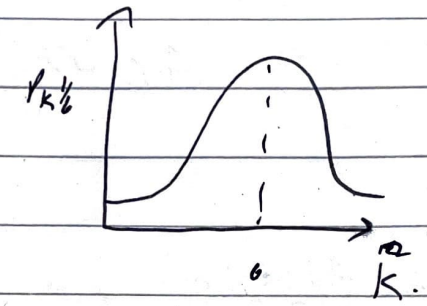
a) $\Omega = \{(i,j) : i,j = 1,2 \dots 6\} = 6^2 = 36$ elements.

b) minimum sum = 2 $\qquad 2 \leq K \leq 12$

maximum sum = ~~#~~ 12

2, 3 ... 12

$\frac{1}{36}$ $\frac{2}{36}$




c) $\Omega_4 = \{(1,1), (1,2), (1,3)$ ~~(1,4)~~

2,1 2,2 2,3 2,4

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

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

5,3 5,4 5,6 5,5

6,5 6,4 6,6

3
4
5
5
4
3
—
24

$P_4 = 24/36 = 2/3$

1.2 $A = \frac{1}{6} \times \frac{6}{6} \times \frac{6}{2} = \frac{36}{216} = \frac{1}{6}$

$B = \frac{2}{} = \frac{1}{6}$

$C = \frac{3}{} = \frac{1}{6}$

$A \cap B = \frac{1}{36}$

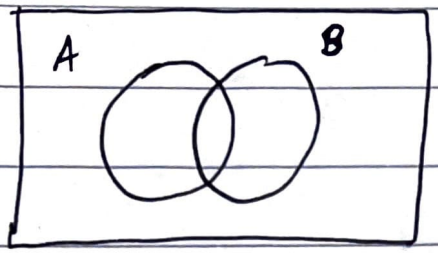
$B \cap C = \frac{1}{36}$

$A \cap C = \frac{1}{36}$

$A \cap B \cap C = \frac{3}{216}$

$A \cup B \cup C = \frac{31}{72}$

1.4

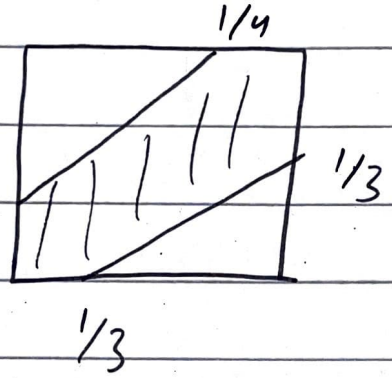



$P[S] = A + B - 2(A \cap B)$

1.5

a) $\frac{20}{60} = 1/3$

b) M




$$1 - \left[ \frac{1}{2} (2/3 \cdot 2/3) + 1/2 (3/4 \cdot 3/4) \right]$$

$$= \frac{143}{288}$$

c) $1 - 2\left(\frac{1}{2}(3/4 \cdot 3/4)\right)$

$= 7/16$

d) $\frac{1}{12} + \frac{1}{34} = \frac{23}{204}$