Probability

Q1.

Prob. ~~of getting~~ for sum of no. being even

Events can be = (1,1), (1,3), (1,5), (2,2), (2,4), (2,6), (3,1)
(3,3), (3,5), (4,4), (4,2), (4,6), (5,1)
(5,3), (5,5), (6,2), (6,4), (6,6)

= 18

$P = 18/36 = 1/2$

one of the dice shows six = $6/36 = 1/6$

Q.2

Prob. ~~less than~~ for sum of no. less than 7

$= \frac{9}{36} = \frac{1}{4}$

Q.3.

H/T H/T H/T

A = at least 2 heads
B = at least 1 head

P(E atleast 2 head / atleast 1 head)

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

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

$= \frac{P(2H)}{P(1H)} \Rightarrow \frac{4/8}{7/8} = 4/7$

H H H ✓
H H T ✓
H T H ✓
T H H ✓
T T T
T T H
T H T
H H T ✓

Q.4 Possibi. of both kids

$= (G, G), (B,B), (G,B), (B,G)$

$$P = (\text{Both } G \mid \text{one girl}) = \frac{P(\text{Both } G)}{P(\text{one girl})}$$

$P(BG) = (.5)\times(.5) = .25$

$P(\text{one girl}) = 1 - (\text{No. girl})$

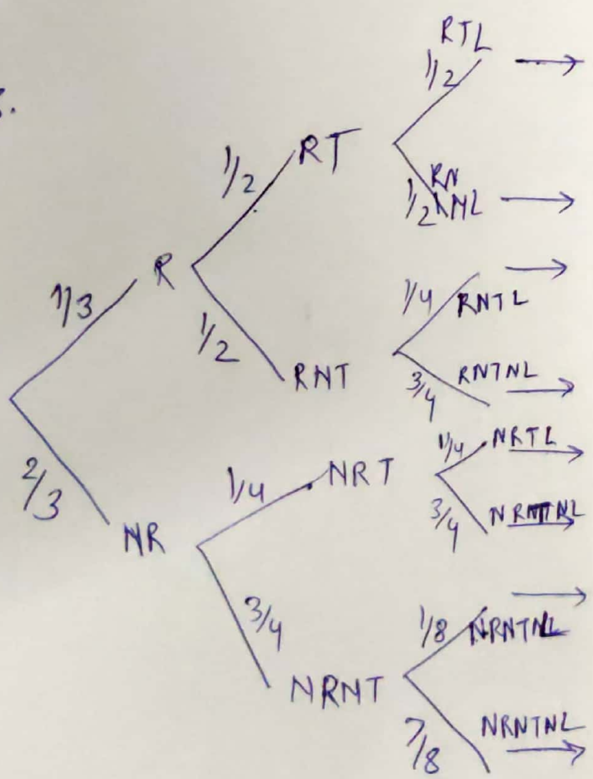
$P(\text{No girl}) = P(B.B) = .5 \times .5 = .25$

$P(\text{one girl}) = 1 - .25 = \underline{.75}$

$$\Rightarrow P(B.G \mid \text{one girl}) = \frac{.25}{.75} = 1/3$$

Chances of second girl is $\underline{1/3}$

Q.5.



$P(\text{Rain Trafic late}) = 1/3 \times 1/2 \times 1/2 = 1/12$

$P(\text{Rain Trafic no delay}) = 1/3 \times 1/2 \times 1/2 = 1/12$

$P(\text{Rain N Traf. late}) = 1/3 \times 1/2 \times 1/4 = 1/24$

$P(\text{Rain N Traf. N late}) = 1/3 \times 1/2 \times 3/4 = 1/8$

$P(\text{N Rain Traf. late}) = 2/3 \times 1/4 \times 1/4 = 1/24$

$P(\text{N Rain Traf. N late}) = 2/3 \times 1/4 \times 3/4 = 1/8$

$P(\text{N Rain N Traf late}) = 2/3 \times 3/4 \times 1/8 = 1/16$

$P(\text{No Rain No Traf. No late}) = 2/3 \times 3/4 \times 7/8 = 7/16$

(a)

$P(NR \, T \, NL) \; \phi$

$P(NR \cap T \cap NL) = P(NR)\, P(T|NR)\, P(NL|NR \cap T)$

$= 2/3 \times 1/4 \times 3/4$

$= \underline{\underline{1/8}}$

(b) Total of late $= P(L) = P(RTL) + P(RNTL) + P(NRTL) +$
$P(NRNTL)$

$= 1/12 + 1/24 + 1/24 + 1/16$

$= \cancel{4/48} \; 11/48$

(C) Late + Rain $= P(R|L) = \dfrac{P(R \cap L)}{P(L)}$

where $P(L) = 11/48$

$P(R \cap L) = P(RTL) + P(RNTL)$

$= 1/12 + 1/24$

$= 1/8$

$\therefore \; P(R|L) = 1/8 / 48/11 = 6/11$