1) Probability of sum of two dice being even and one being 6

Sample space is 36

Desired outcomes = (2,6) (4,6) (6,6)
(6,2) (6,4) (6,6)

P('Even Sum & Atleast one 6) = 6/36 = 1/6 //

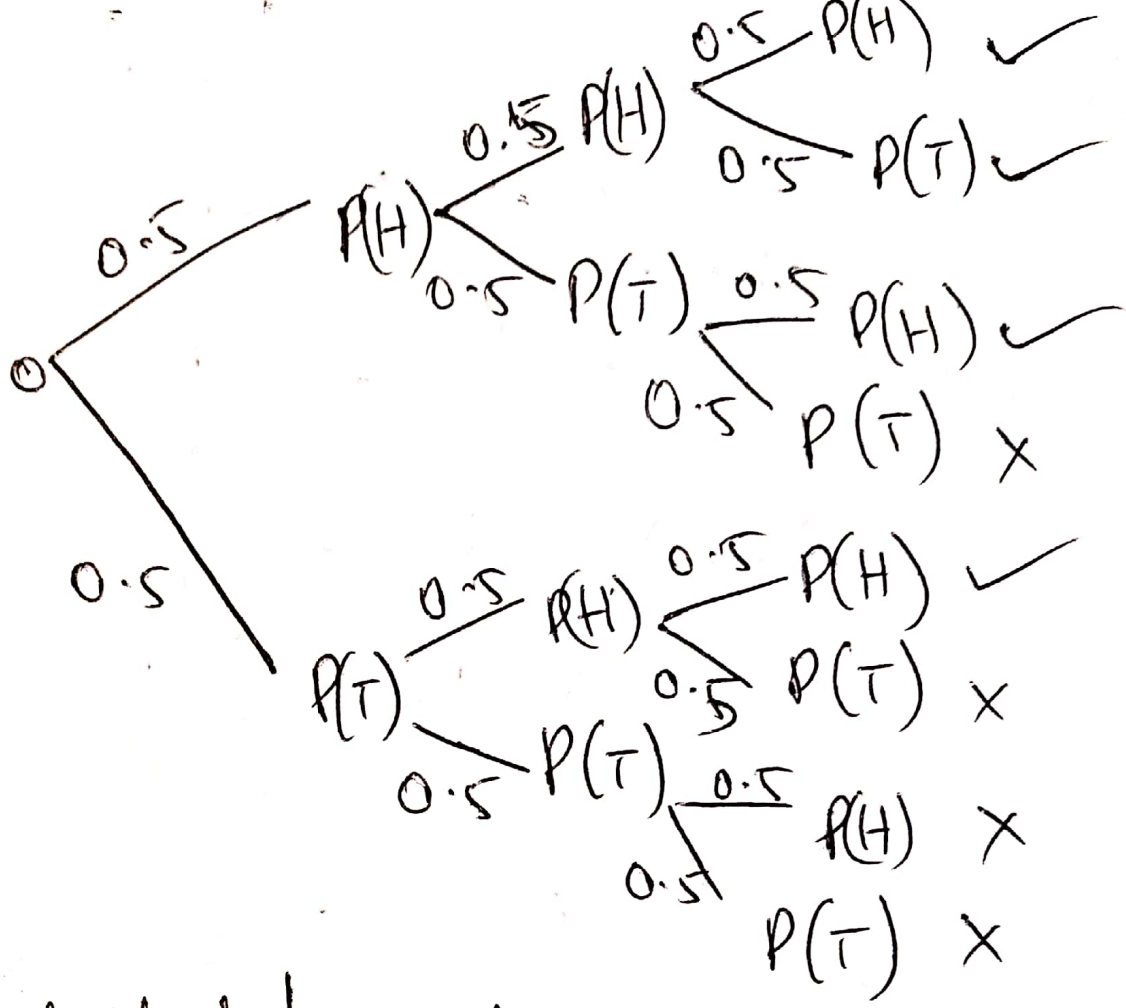
2) Sum of number < 7

Sample Space = 36

Desired outcome = (1,1) (1,2) (1,3) (1,4) (1,5)
(2,1) (2,2) (2,3) (2,4)
(3,1) (3,2) (3,3)
(4,1) (4,2)
(5,1)

P(Sum < 7) = 15/36 = 5/12 //

3)

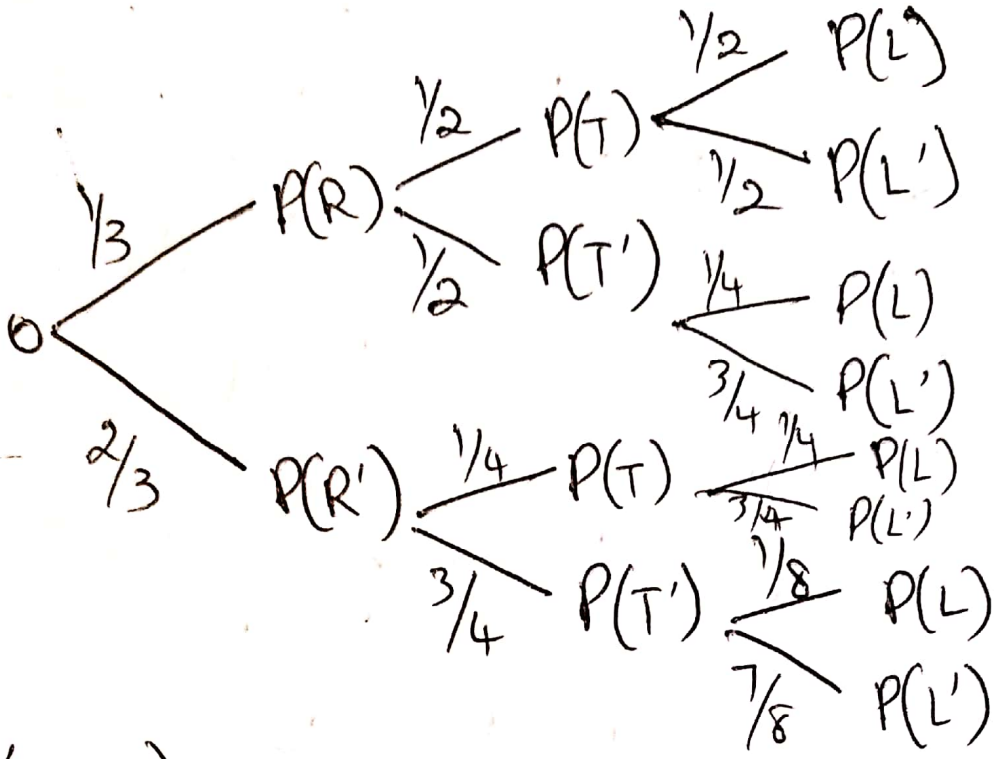


$P(\text{At least 2 heads} \mid \text{one head has occured})$

$$= \frac{(0.5 \times 0.5 \times 0.5) + (0.5 \times 0.5 \times 0.5) + (0.5 \times 0.5 \times 0.5) + (0.5 \times 0.5 \times 0.5)}{1 - (0.5 \times 0.5 \times 0.5)}$$

$$= \frac{1/8 + 1/8 + 1/8 + 1/8}{1 - 1/8} = \frac{\frac{4}{8}}{\frac{7}{8}} = \frac{4 \times 8}{8 \times 7} = \frac{4}{7}$$ //

4)



$P(R'TL') = 1/3 \times 1/2 \times 3/4 = 3/24 = 1/8$

$P(L) = (1/3 \times 1/2 \times 1/2) + (1/3 \times 1/2 \times 1/4) + (2/3 \times 1/4 \times 1/4) + (2/3 \times 3/4 \times 1/8)$

$= 1/12 + 1/24 + 2/48 + 6/96$

$= 1/12 + 1/24 + 1/24 + 1/16 = \frac{2}{24} + \frac{1}{12} + \frac{1}{16}$

$= 0.2291 \simeq 23\%$

$$P(R|L) = \frac{P(L/R) * P(R)}{P(L)} = \frac{P(L \cap R)}{P(L)}$$

$$= \frac{(1/3 \times 1/2 \times 1/2) + (1/3 \times 1/2 \times 1/4)}{0.2291}$$

$$= \frac{\frac{1}{12} + \frac{1}{24}}{0.2291} = \frac{\frac{3}{24}}{0.2291} = 0.5456 = 55\%$$

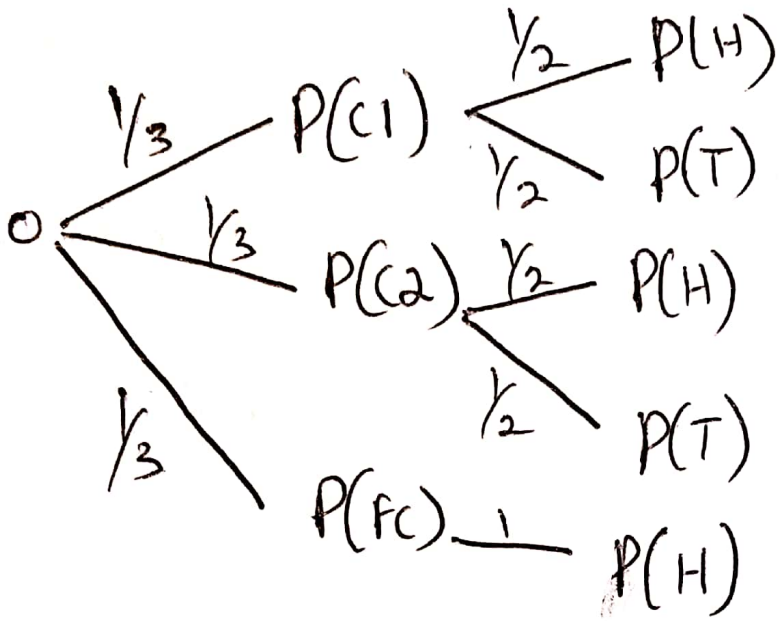
//

P(H)

0.5 P(T)

5)

A)



$$P(H) = (1/3 \times 1/2) + (1/3 \times 1/2) + (1 \times 1/3)$$

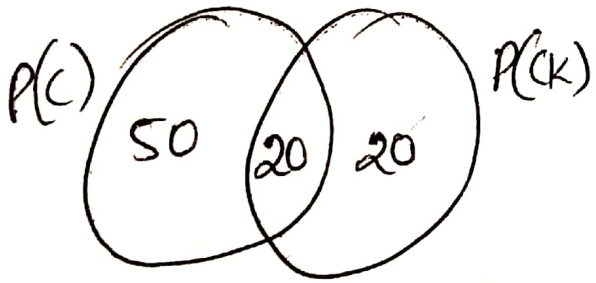
$$= \frac{1}{6} + \frac{1}{6} + \frac{1}{3} = \frac{2}{6} + \frac{1}{3} = \frac{4}{6} = 2/3 //$$

b) $P(FC|H) = \dfrac{P(H|FC) \times P(FC)}{P(H)}$

$= \dfrac{P(H \cap FC)}{P(H)} = \dfrac{1/3 \times 1}{2/3} = \dfrac{1/3}{2/3}$

$= \dfrac{3}{6} = 1/2$ //

6] $P(C) = 70\%$. $P(CK) = 40\%$. $P(C \cap CK) = 20\%$.



$P(C|CK) = \dfrac{P(CK|C) \times P(C)}{P(CK)} = \dfrac{20\%}{40\%} = 50\%$ //

7) $\mu = 50 \quad \sigma = 6$

$\mu_{sample} = \mu_{population} = 50$

$$S = \frac{\sigma}{\sqrt{n}} = \frac{6}{\sqrt{16}} = \frac{6}{4} = 3/2 = 1.5 \;//$$

b) $\mu_{sample} = \mu_{popu} = 50$

$$S = \frac{6}{\sqrt{20}} = 1.341 \;//$$

8) $\mu = 100 \;, \sigma = 12$

$$Z = \frac{x - \mu}{\sigma} = \frac{110 - 100}{12} = \frac{10}{12} = 0.833$$

~~0.833 < 1 standard deviation~~

~~0.8333~~ P value = .7967 ≃ 80%

Probability of score > 110 = 1 - 0.7967

= 0.2033 ≃ 21% //

b) ~~105~~

$$Z = \frac{105-100}{\frac{12}{\sqrt{25}}} = \frac{5 \times 5}{12} = 2.0833$$

P value = .9812 ≃ 98%

Probability of greater than 105 = 100 − 98 = 2% //

c)

$$Z = \frac{105-100}{\frac{12}{\sqrt{64}}} = \frac{5}{\frac{12}{8}} = \frac{5 \times 8}{12} = 3.333$$

P value = 0.9996

Probability > 105 = 1 − 0.9996 = 0.0004

= 0.004% //

d) $Z_1 = \frac{105-100}{\frac{12}{\sqrt{16}}}$ $Z_2 = \frac{95-100}{\frac{12}{\sqrt{16}}}$

$Z_1 = 1.666$ $Z_2 = -1.666$

$P_1 = 0.9515$ $P_2 = 0.0485$

$P(105 > x < 95) = 0.903 = 90\%$ //

$\bar{x} - \mu = \frac{1.64 \times 2.0}{14.222}$

2.8

$\mu =$

10] $\sigma = 2.8$

$\bar{x} = 14.222$

$n = 9$

95% CI limit $= \bar{x} \pm z \frac{\sigma}{\sqrt{n}}$

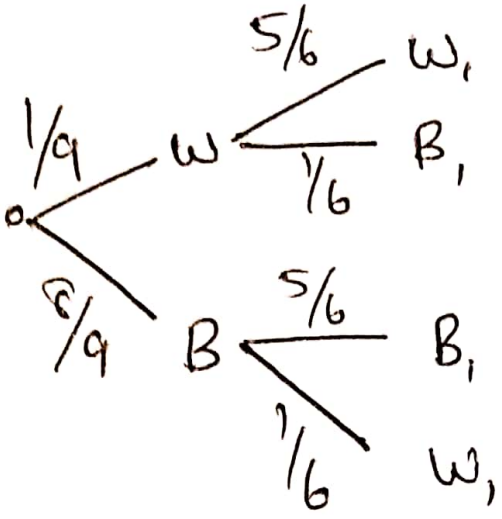
$= 14.222 \pm 1.645 \left(\frac{2.8}{\sqrt{9}}\right)$

$= 14.222 \pm 1.645 \left(\frac{2.8}{3}\right)$

$= 14.222 \pm 1.5353$

$= 12.686$ to 15.757

11)



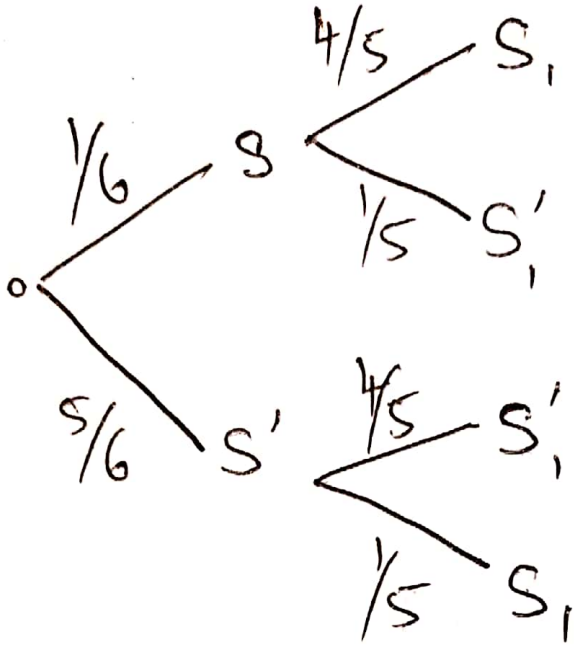
$$P(W|W_1) = \frac{P(W_1|W) \times P(W)}{P(W_1)}$$

$$= \frac{5/6 \times 1/9}{(1/9 \times 5/6) + (8/9 \times 1/6)}$$

$$= \frac{5/54}{5/54 + 8/54} = \frac{5/54}{13/54} = \frac{5 \times 54}{54 \times 13}$$

$$= 5/13 \;//$$

12]



$$P(S|S_1) = \frac{P(S_1|S) \times P(S)}{P(S_1)}$$

$$= \frac{\frac{4}{5} \times \frac{1}{6}}{\left(\frac{1}{6} \times \frac{4}{5}\right) + \left(\frac{5}{6} \times \frac{1}{5}\right)}$$

$$= \frac{4/30}{4/30 + 5/30} = \frac{4/30}{9/30} = \frac{4 \times 30}{9 \times 30}$$

$$= 4/9 \;//$$