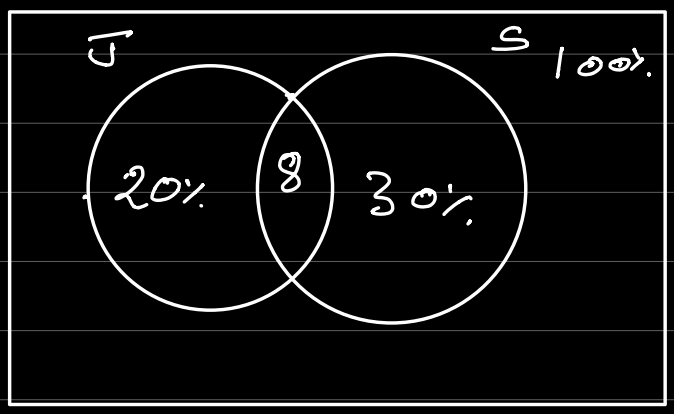
10]



Bank	Susan at Bank	Susan not at Bank
Jerry at bank	8%	12%
Jerry not at bank	22%	58%

a) P(Jerry at bank given susan was there)

$$P(\text{Jerry}/\text{Susan}) = \frac{8}{22+8} = 0.266 = 26.6\%$$

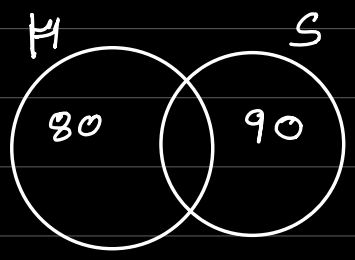
b) P(Jerry at bank given susan was not there)

$$P(\text{Jerry}/\overline{\text{Susan}}) = \frac{12}{58+12} = 0.171 = 17.1\%$$

c) P(both were there given atleast one of them was there)

$$\frac{P(\text{Jerry} \cap \text{Susan})}{P(\text{Jerry} \cup \text{Susan})} = \frac{8}{12+22+8} = 0.190\% = 19.04\%$$

1.2]



$P(H) = 80\%$

$P(S) = 90\%$

$P(H \cup S) = 91\%$

$$P(H \cup S) = P(H) + P(S) - P(H \cap S)$$

$$P(H \cap S) = P(H) + P(S) - P(H \cup S)$$

$$P(H \cap S) = 80 + 90 - 91$$

$$P(H \cap S) = 170 - 91$$

$$P(H \cap S) = 79$$

a) $P(\text{Only Harold}) = P(H) - P(H \cap S)$

$= 80 - 79$

$= 1\%$

b) $P(\text{only shaeon}) = P(S) - P(H \cap S)$

$= 90 - 79$

$= 11\%$

c) $P(\text{none}) = 100 - P(H \cup S)$

$= 100 - 91$

$= 9\%$.

1.3]

$P(\text{Jerry}) = 20\%$

$P(\text{Susan}) = 30\%$

$P(J \cap S) = 8\%$

If A & B are independent then,

$$P(A \cap B) = P(A) * P(B)$$

Here it is given,

$$P(J \cap S) = 8\%$$

and

$$P(J) * P(S) = 20 \times 30$$

$$= 60\%$$

So the events "Jerry is at bank" and "Susan is at bank" are not independent.

1.4]

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

a)

$$P(\text{sum is } 6) = \frac{5}{36}$$

$$P(\text{second die show } 5) = \frac{6}{36} = \frac{1}{6}$$

$$P(\text{sum is } 6 \cap \text{second ie show } 5) = \frac{1}{36}$$

Acc to independent prob,

$$P(\text{sum is } 6 \cap \text{second die show } 5) = \frac{5}{36} \times \frac{1}{6}$$

$$= \frac{5}{}$$

Hence both events are not independent.

b)

$$P(\text{sum is } 7) = \frac{6}{36} = \frac{1}{6}$$

$$P(\text{first die shows } 5) = \frac{6}{36} = \frac{1}{6}$$

$$P(\text{sum is } 7 \cap \text{first die shows } 5) = \frac{1}{36}$$

Acc to independent probability,

$$P(\text{sum is } 7 \cap \text{first die shows } 5) = \frac{1}{6} * \frac{1}{6}$$

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

Both events are independent.

1.5]

TX = 60%.

NJ = 10%.

AK = 100 − (60 + 10)

= 30%.

Chances of finding oil.

$$Tx = \frac{60 \times 30}{100} = 18\%$$

$$AK = \frac{30 \times 20}{100} = 6\%$$

$$NJ = \frac{10 \times 10}{100} = 1\%$$

	Tx	AK	NJ	
oil Found	18%	6%	1%	25%
oil not found	42%	24%	9%	75%
	60%	30%	10%	100

a) P(Finding oil) = 25%.

b) PC Drilled in Tx given they found oil)

$$= \frac{18}{25} = 0.72 = 72\%.$$

1.6]

a) No of passengers that did not survive = 1490

Total number of passengers = 2201

PC passenger did not survive) = $\frac{1490}{2201}$

$= 0.676$

$= 67.6\%.$

b) Number of passengers staying in first class = 325

PC staying in first class) = $\frac{325}{2201}$

$= 0.147$

$= 14.7\%$

c)

Survived passengers staying in first class $= \underline{203}$

$P(\text{First class} / \text{survived}) = \frac{203}{711}$

$= 0.285$

$= 28.5\%$

d)

$P(\text{survival}) = \frac{711}{2201}$

$= 0.323$

$= 32.3\%$

$P(1^{st} \text{ class}) = \frac{325}{2201}$

$= 0.147$

$= 14.7\%$

$P(\text{First}/\text{survided}) = \frac{203}{711}$

$= 0.285$

$= 28.5\%$

$P(\text{First}/\text{survived}) \neq P(S) * P(1^{st})$

so Not independend.

e)

Passengers survived = 711

No of child in first class who survived = 6.

$P(C/\text{survived}) = \frac{6}{711}$

$= 0.008$.

f).

Number of adults who survived

$= 654$

$P(\text{Adult} / \text{survived}) = \frac{654}{711} = 0.919$

$= 91.9\%$.

g)

$\rightarrow P(1^{st} \text{ class} / \text{survived}) = \frac{203}{711}$

$= 0.285$

$= 28.5\%$

$P(\text{Adult} / \text{survived}) = \frac{654}{711}$

$= 0.919$

$= 91.9\%$

$P(\text{Adult} \mid 1^{st}\text{class} \mid \text{survived})$

$= \frac{197}{711}$

$= 0.277$

$= 27.7$

$P(1^{st}\text{class} \mid \text{survived}) * P(\text{Adult} \mid \text{sur})$

$\neq$

$P(\text{Adult} \mid 1^{st}\text{class} \mid \text{survived})$

So events are not independent

$\rightarrow P(\text{child} \mid \text{survived} = \frac{57}{711}$

$= 0.080$

$= 80\%$

$\rightarrow P(C \text{ child} / 1^{st} \text{class} / \text{survived}) = \frac{6}{711}$

$= 0.0084$

$= 0.84\%$

This event is also not independent