$= 18/43$

$= 0.4186$

(l) (DELL given that Red) = ?

$$= \frac{P(\text{Dell and Red})}{P(\text{Dell})}$$

$$= \frac{16/188}{31/188}$$

$= 16/31$

$= 0.5161$

0.5161 is the Probablity that randomly selected Laptop which is given in Red Color.

4- ADDITIVE RULE or U

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

(m) Red or HP ?

$P(R \text{ or } HP) = P(Red) + P(HP) - P(Red \text{ and } HP)$

$P(R \text{ or } HP) = 31/188 + 69/188 - 10/188$

$P(R \text{ or } HP) = 0.4787$

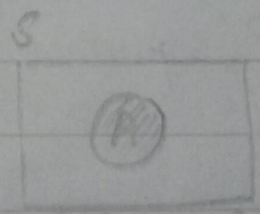
(n) P(HP or DELL) ?

$P(HP \text{ or } Dell) = P(HP) + P(Dell) - P(HP \text{ and } Dell)$

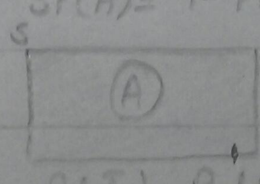
$P(HP \text{ or } Dell) = 69/188 + 76/188 - 0/188$

$P(HP \text{ or } Dell) = 0.7712$

5- COMPLEMENT RULE:



$P(\bar{A}) = 1 - P(A)$



$P(\bar{A}) = P(\text{Not } A)$

QUESTION #17:

Class	Yes	No	No Opinion
Freshmen	15	8	5
Sophomores	24	4	2

If a student is selected at random, find the probablity that the student-

a. Has no opinion

b. Is a freshman or is against the issue

c. Is a sophomore & favours the issue

Class	Yes	No	No Opinion	Total
Freshmen	15	8	5	28
Sophomores	24	4	2	30
Total	39	12	7	58

a. $P(\text{no opinion}) = \frac{7}{58} = 0.1206$

b. $P(\text{freshman or against issue}) = P(\text{freshmen}) + P(\text{against issue}) - P(\text{freshman and against})$

$P(\text{freshman or against issue}) = \frac{28}{58} + \frac{12}{58} - \frac{8}{58}$

$P(\text{freshman or against issue}) = 0.5517$

c. $P(\text{sophomore \& favours}) = \frac{\text{Intersection frequency}}{\text{total \# of outcomes}}$

$P(\text{Sophomore \& favours}) = \frac{24}{58}$

$P(\text{sophomore \& favours}) = 0.4137$

QUESTION # 18:

Delivered to	Letters	Ads	Magazines	Total
Home	325	406	203	934
Business	732	1021	97	1850
Total	1057	1427	300	2784

If an item of mail is selected at random, find these probablities

a. The item went to a home

b. The item was an ad, or it went to a business

c. The item was a first class letter, or it went to a home.

a- $P(\text{item went to a home}) = \frac{934}{2784}$

$P(\text{item went to a home}) = 0.335$

b- $P(\text{ad or Went to business}) = P(\text{ad}) + P(\text{business}) - P(\text{ad and business})$

$P(\text{ad or business}) = \frac{1427}{2784} + \frac{1057}{2784} - \frac{1021}{2784}$

$P(\text{ad or business}) = 0.5255$

c- $P(\text{letter or home}) = P(\text{letter}) + P(\text{home}) - P(\text{letter and home})$

$P(\text{letter or home}) = P(\frac{1057}{2784} + \frac{934}{2784} - \frac{325}{2784}$

$P(\text{letter or home}) = 0.5984$

QUESTION # 30:

	Cookies	Mugs	Candy	Total
Coffee	20	13	10	43
Tea	12	10	12	34
Total	32	23	22	77

Choose 1 basket at random. Find the Probablity that it contains.

a- Coffee or Candy

b- Tea given that it contains Mugs

c- Tea and Cookies

a- P (coffee or Candy) = P(Coffee) + P(Candy) − P(Coffee and Candy)

$$P(\text{coffee or Candy}) = \frac{43}{77} + \frac{22}{77} - \frac{10}{77}$$

P(coffee or Candy) = 0.71428

b- $P(\text{Tea given that mugs}) = \frac{P(\text{Tea and mugs})}{P(\text{mugs})}$

$$P(\text{Tea given that mugs}) = \frac{10/77}{23/77}$$

P(Tea given that mugs) = 10/23

P(Tea given that mugs) = 0.4347

c- $P(\text{Tea \& Cookies}) = \frac{\text{Interaction Frequency}}{\text{Total \# of outcomes}}$

$$P(\text{Tea \& cookies}) = \frac{12}{77} = 0.1558$$

QUESTION #33

	Gold	Silver	Bronze	Total
United States	36	38	36	110
Russia	23	21	28	72
China	51	21	28	100
Great Britian	19	13	15	47
Others	173	209	246	628
Total	302	302	353	957

a- Find the Probablity that the winner won the gold medal, given that the winner was from the United States

b- Find the Probablity that the winner was from the United States, given that she or he won a gold medal

c- Are the events "medal" winner is from United states & "gold medal won" independant?

Explain: No $P(G|US) \neq P(G)$

$$P(\text{gold medal given that United States}) = \frac{P(\text{gold and United S})}{P(\text{United States})}$$

$$P(\text{gold Medal given that US}) = \frac{36/957}{110/957}$$

$$P(\text{gold M given that US}) = 0.3272$$

$$P(\text{united given that Goldm}) = \frac{P(\text{united and Gold})}{P(\text{Gold})}$$

$$P(\text{united given that G}) = \frac{36/957}{302/957}$$

$$P(\text{United given that Gold M}) = 0.1192$$

c: Not same dependant

SAME INDEPENDANT

$P(A/B) = P(A)$

NOT SAME DEPENDANT

$P(A/B) \neq P(A)$

QUESTION # 24

MULTIPLICATIVE RULE:

$n \geq 2$

If we select a 2 events at random

$P(A_1 \text{ And } B_2) = P(A_1)\,P(B_2)$

If we select 3 events at random

$P(A_1 \text{ and } B_2 \text{ and } C_3) = P(A_1)\,P(B_2)\,P(C_3)$

Example No 1:

* 10 white cars
* 12 black cars

Total 22 Cars

If we select 2 cars at random Find the Probablity that

(a) Both cars are white

$P(W_1 \text{ and } W_2) = P(W_1)\,P(W_2)$

$P(W_1 \text{ and } W_2) = \left(\frac{10}{22}\right)\left(\frac{10}{22}\right)$

$P(W_1 \text{ and } W_2) = 0.2066$

(b) Both cars are Black

$P(B_1 \text{ and } B_2) = P(B_1)\,P(B_2)$

$P(B_1 \text{ and } B_2) = \left(\frac{12}{22}\right)\left(\frac{12}{22}\right)$

$P(B_1 \text{ and } B_2) = 0.2975$

(c) First is White & Second is Black

$P(W_1 \text{ and } B_2) = P(W_1) \cdot P(B_2)$

$P(W_1 \text{ and } B_2) = \left(\frac{10}{22}\right)\left(\frac{12}{22}\right)$

$P(W_1 \text{ and } B_2) = 0.2479$

(d) First is Black & second is White

$P(B_1 \text{ and } W_2) = P(B_1) \cdot P(W_2)$

$P(B_1 \text{ and } W_2) = \left(\frac{12}{22}\right) \cdot \left(\frac{10}{22}\right)$

$P(B_1 \text{ and } W_2) = 0.2479$

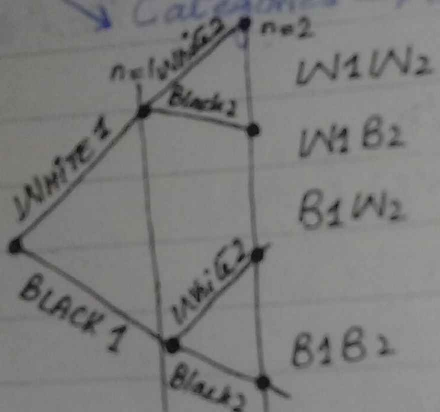
* NOTE: Sample Space = 1

$P(S) = 1$

FOR TOTAL OUTCOMES: (TREE DIAGRAMS):

selection → $n = 2$

Categories → $K = 2$ (White & Black)



(e) ATLEAST 1 is White

⇒

X = The Number of White

P (at least 1 is white)

$P(X \geq 1) = P(W_1W_2) + P(W_1B_2) + P(B_1W_2)$

$= 0.2066 + 0.2479 + 0.2479$

$= 0.7024$

* OR

$P(\text{at least 1 is White}) = 1 - P(NW_1 - NW_2)$

P(at least 1 is ...

QUESTION...

Computer Ow...

At A Local uni...

year student...

selected at ...

a- None hav...

b- Atleast o...

c- All have ...

a- $\frac{54 \cdot 3}{100}$

P(non ...

P(non h...

P(non h...

P(non h...

P(non h...

b- P(Atle...

P(Atle...

c- P(All h...

P(All h...

P(All h...

$P(\text{atleast 1 is White}) = 1 - P(B_1 \text{ and } B_2)$
$= 1 - 0.2975$
$= 0.7025$

QUESTION # 34:

Computer Ownership

At A Local university 54.3% of incoming first year students have computers. If 3 students are selected at random, find the following probablities

a- None have Computers

b- Atleast one has a Computer

c- All have Computers.

a- $\frac{54.3}{100} = 0.543$

$P(\text{non have Computers}) = 1 - P(\text{non have Computers})$

$P(\text{non have Computers}) = 1 - 0.543$

$P(\text{non have Computers}) = 0.457$

$P(\text{non have Computers}) = (0.457)(0.457)(0.457)$

$P(\text{non have Computers}) = 0.09544$

b- $P(\text{Atleast One has a Computer}) = 1 - 0.09544$

$P(\text{Atleast one has a Computer}) = 0.90456$

c- $P(\text{All have Computers}) = P(C_1)\,P(C_2)\,P(C_3)$

$P(\text{All have Computers}) = (0.543)(0.543)(0.543)$

$P(\text{All have Computers}) = 0.1601$

QUESTION #35:

Leisure time exercise Only 27% of US adults get enough leisure time exercise to achieve cardiovascular fitness. Choose 3 adults at random. Find the probability that:

a- All 3 get enough daily exercise

b- Atleast 1 of the three gets enough exercise

a- P(All 3 gets enough exercise) = 27%

P(All 3 gets enough exercise) = $\frac{27}{100}$

P(All 3 gets enough exercise) = 0.27

$P(A_1 \text{ and } A_2 \text{ and } A_3) = P(A_1)\,P(A_2)\,P(A_3)$

$P(A_1 \text{ and } A_2 \text{ and } A_3) = (0.27)(0.27)(0.27)$

$P(A_1 \text{ and } A_2 \text{ and } A_3) = 0.0196$

b- P(Atleast 1 get enough exercise) = 1 − 0.27

P(Atleast 1 get enough exercise) = 0.73

P(Atleast 1 of 3 get enough exercise) = (0.73)(0.73)(0.73)

P(At least 1 of 3 get enoughe) = 0.3890

P(Atleast 1 of 3 get enoughe) = 1 − 0.3890

P(Atleast 1 of 3 get enoughex) = 0.611

QUESTION # 36:

Customer Purchases: In a department store there are 120 customers, 90 of whom will buy atleast 1 item. If 5 customers are selected at random, one by one, find the probablity that all will buy atleast 1 item.

120 customers

90 of whom will buy atleast 1 item

~~$P(C_1 \text{ and } C_2 \& C_3 \& C_4 \& C_5) = \left(\frac{90}{120}\right)\left(\frac{90}{120}\right)\left(\frac{90}{120}\right)\left(\frac{90}{120}\right)\left(\frac{90}{120}\right)$~~

$P(C_1 \& C_2 \& C_3 \& C_4 \& C_5) = \left(\frac{90}{120}\right)\left(\frac{89}{119}\right)\left(\frac{88}{118}\right)\left(\frac{87}{117}\right)\left(\frac{86}{116}\right)$

$P(C_1 \& C_2 \& C_3 \& C_4 \& C_5) = 0.2306$

* If Percentage is given then, it is called "Independant Events"

If Percentage is not given, then it is called "Dependant Events"

MULTIPLICATIVE RULE:

Dependant Events (Without Replacement) 10, 9, 8, 7 .....

Independant Events (With replacement) 10·10·10

$P(A_1 \text{ and } B_2) = P(A_1)\ P(B_2)$

. If we select 3 events at random

$P(A_1 \& B_2 \& C_3) = P(A_1)P(B_2)P(C_3)$

$\underbrace{\text{RANDOM}}_{\text{Which associated it's Probablity}}\ \underbrace{\text{VARIABLES:}}_{\text{interested things}}$

QUESTION # 37:

Marital status of Women: According to the Statistical Abstract of the United States, 70.3% of female ages 20 to 24 have never been married. Choose 5 young women in this age category at random. Find the probablity that:

a- None has ever been married

b- Atleast 1 has been married.

a- $70.3\% = \frac{70.3}{100} = 0.703$

$P(W_1 \& W_2 \& W_3 \& W_4 \& W_5) = P(W_1)P(W_2)P(W_3)P(W_4)P(W_5)$

$= (0.703)(0.703)(0.703)(0.703)(0.7$

$= 0.17170$

b- P(Atleast 1 has been Married) $= 1 - 0.17170$

P(Atleast 1 has been Married) $= 0.8283$

QUESTION # 38:

Fatal Accidents: The American Automobile Association (AAA) reports that of the fatal car and truck accidents, 54% are caused by car driver error. If 3 accidents are choosen at random, find the Probablity that:

a: All are caused by car driver error

b: None is caused by car driver error

c: Atleast 1 is caused by car driver error

P(All are caused by c

P(All are caused by

- P(None is caus

P(None is caused

- P(Atleast 1 is

P(Atleast 1

QUESTIO

On Time Airpla

airport led n

in the last q

rate. Choose

Probablity

$P(A_1 \& A_2 \& A_3 \& A$

P(Atleast 1 was n

P(Atleast 1 was

a- $P(\text{All are caused by car driver error}) = \frac{54}{100} = 0.54$

$P(\text{All are caused by car driver error}) = (0.54)(0.54)(0.54)$

$= 0.15746$

b- $P(\text{None is caused by car driver error}) = 1 - 0.54$

$= 0.46$

$= (0.46)(0.46)(0.46)$

$P(\text{None is caused by car driver error}) = 0.0973$

c- $P(\text{Atleast 1 is caused by carde}) = 1 - 0.0973$

$P(\text{Atleast 1 is caused by carde}) = 0.9027$

QUESTION # 39:

On Time Airplane Arrivals The greater cincinatti airport led major US airports on-time arrivals in the last quarter of 2005 with an 84.3% on time rate. Choose 5 arrivals at random & find the Probablity that atleast one was not on time.

$84.3\% = \frac{84.3}{100} = 0.843$

$P(A_1 \,\&\, A_2 \,\&\, A_3 \,\&\, A_4 \,\&\, A_5) = (0.843)(0.843)(0.843)(0.843)(0.843)$

$= 0.4257$

$P(\text{Atleast 1 was not on time}) = 1 - 0.4257$

$P(\text{Atleast 1 was not on time}) = 0.5743$

X= No of white cars

X	P(X)	$x_i P(x_i)$	$x_i^2 P(x_i)$
0	0.2975	0.0	0
1	0.4958	0.4958	0.495
2	0.2065	0.8264	0.4132
	P(S)=1	1.3222	0.909

$E[X] = \mu =$ Expected Value of X

$\mu = \sum x_i P(x_i)$

$\sigma^2 = \sum x_i^2 P(x_i) - \mu^2$

$\sigma = \sqrt{\text{variance}}$

$\mu = \sum x_i P(x_i)$

$= 0(0.2975) + 1(0.4958) + 2(0.2066)$

$= 0.909$

$\sigma^2 = \sum x_i^2 P(x_i) - \mu^2$

$\sigma^2 = (0)^2(0.2975) + (1)^2(0.4958) + 2^2(0.2066)$

$\sigma^2 = 1.322 - 0.8262$

$\sigma^2 = 0.4959$

$\sigma = \sqrt{\text{variance}}$

$\sigma = \sqrt{0.4959}$

$\sigma = 0.704$

Discrete Probability

Number of Suits Sold X	Probablity P(x)	xiP(xi)	$xi^2 P(xi)$
19	0.2	3.8	72.2
20	0.2	4	80
21	0.3	6.3	132.3
22	0.2	4.4	96.8
23	0.1	2.3	52.9
	P(S)=1	20.8	434.2

$$\sigma^2 = \sum x^2 i \, P(xi) - \mu^2$$

$$= 434.2 - (20.8)^2$$

$$= 434.2 - 432.64$$

$$= 1.56$$

$$\sigma = \sqrt{\text{variance}}$$

$$\sigma = \sqrt{1.56}$$

$$\sigma = 1.2489$$

AVERAGE * MEAN

$$= 20.8 \times 5 = 104$$

·2066)

NUMBER OF CREDIT CARDS:

Cards X	Probablity P(X)	xiP(xi)	xi^2 (Pxi)
0	0.18	0	0
1	0.44	0.44	0.44
2	0.27	0.54	1.08
3	0.08	0.24	0.72
4	0.03	0.12	0.48
		1.34	2.72

$\sigma^2 = \sum x_i^2 P(x_i) - \mu^2$

$= 2.72 - (1.34)^2$

$= 2.72 - 1.7956$

$\sigma^2 = 0.9244$

$\sigma = \sqrt{\text{variance}}$

$\sigma = \sqrt{0.9244}$

$\sigma = 0.9614$

Question #04

X	Probability (X)	$x_i P(x_i)$	$x_i^2 P(x_i)$
5	0.05	0.25	1.25
6	0.2	1.2	7.2
7	0.4	2.8	19.6
8	0.1	0.8	6.4
9	0.15	1.35	12.15
10	0.1	1	10
	$P(S) = 1$	7.4	56.6

$\sigma^2 = \sum x_i^2 P(x_i) - \mu^2$

$= 56.6 - (7.4)^2$

$= 56.6 - 54.76$

$= 1.84$

BINOMIAL DISTRIBUTION

A binomial experiment is a probablity experiment that satisfies the following four requirements:

1- There must be a fixed number of trials.

2- Each trial can have only two outcomes or outcomes that can be reduced to two outcomes. These outcomes can be considered as either success or failiure.

3. The outcomes of each trial must be independant of one another

4- The probablity of a success must remain the same for each trial

Remember!

Binomial means 2 outcomes like success failiure like defective/not defective like working/non working

→ We discuss (n) in binomial distribution

→ We fix (n) means number of trials

→ (n) can be any number

→ Any thing which can we present in 2 groups

→ First is in
P(interes
P(not in
→ summision
P-
→ Probab
= 1
When o
other's s

→ First is in which we are intrested
P(interested) = P
P(not interested) = q

→ summision of Relative Frequency is 1
$P + q = 1$

→ Probablity of interested + probablity of failure = 1

- When one probablity is given we can find other's probablity through the given one.

Pg# 274

Example 5-19:

→ Survey on Fear of Being Home Alone or at Night

- Public opinion reported that 5% of American are afraid of being alone in a house at night. of a random sample of 20 students is selected find these probablities by using table

X = The number of People

$P = 5\% = 0.05$

$q = 1 - P = 1 - 0.05 = 0.95$

sum should be = 1

$n = 20$

$q = 0.95$

@ $P(X=5) = ?$

Binomial Probablity Formula

In a binomial experiment, the probablity of exactly x successes in n trial is

$$P(X) = \frac{n!}{(n-X)!\,X!} \cdot p^{X} \cdot q^{n-X}$$

We will not use formula, we use table to find out Probablity

see table on Pg # 775
When we use Table for Binomial distributi-on, so we required 2 values P & n with respect to X

$X = 5$ & $5 = 0.002$

$P(X) = 4$?

$X = 4$ & $4 = 0.013$

(b) $P(x < 2) = P(0) + P(1)$

$= 0.358 + 0.377$

$= 0.735$

(b) $P(x < 3) = P(0) + P(1) + P(2)$

$= 0.358 + 0.377 + 0.189$

$= 0.924$

(c) P(atmost 3)

$= P(X \leq 3)$

$= P(0) + P(1) + P(2) + P(3)$

$= 0.358 + 0.377 + 0.189 + 0.060$

$= 0.984$

(d) $P(X \geq 3) = P(3) + P(4) + \cdots P(5)$

$= 0.060 + 0.013 + 0.002$

$= 0.075$

Fe
st
P

$(X = 2)$ $P = 0.4$ $n = 5$

a) Exactly 2 people will agree with that statement

$P(\text{exactly } 2) = 0.346$

b) At most 3 people will agree with that statement

$P(\text{at most } 3) = P(0) + P(1) + P(2) + P(3)$

$= 0.078 + 0.259 + 0.346 +$

0.230

$= 0.913$

c- At least 2 people will agree with that statement

$P(\text{atleast } 2) = 0.346 + 0.230 + 0.077 + 0.010$

$= 0.663$

d- Fewer than 3 people will agree with that statement.

$P(x < 3) = P(0) + P(1) + P(2)$

$= 0.078 + 0.259 + 0.346$

$= 0.683$

In a company 60% employees having cellphones. If we select 10 employees randomly

Find the prob that

(a) Exactly 4 have cellphone

$60\% = \frac{60}{100} = 0.6$

$n = 10$

$X = 4$

$P(\text{exactly}4) = 0.111$

(b) less than 5 have cellphones

$P(\text{less than}) = P(0)+P(1)+P(2)+P(3)+P(4)$

$= 0.002 + 0.011 + 0.042 + 0.111$

~~= 0.562~~ = 0.166239

(c) more than 8 have cellphones

$P(X \geq 8)$ $P(9) + P(10)$

$= 0.040 + 0.006$

$= 0.046$

(d) atleast 3 have cellphones

~~P(at least 3) = 0.042~~

~~= 0.040 + 0.006~~

~~= 0.046~~

$P(\text{at least } 3) = P(3) + \dots P(10)$

$= 0.987$

(e) atmost 2 have

$P(x \geq 23) = P(30$

$= 0+$

$= 0.0$

(f) from 3 10

$P(x > 3\ 10\ x$

(e) atmost 2 have cellphones

$P(x \geq 23) = P(30) + P(1) + P(2)$

$= 0 + 0.002 + 0.011$

$= 0.013$

(f) from 3 to 7 have cellphones

$P(x > 3 \text{ to } x \geq 7) = P(3) + P(4) + P(5) + P(6) + P(7)$

$= 0.043 + 0.111 + 0.201 + 0.251$

$= + 0.215$

$= 0.82$

POISSON PROBABLITY DISTRIBUTION

Introduction:

1- Discrete random variable.

2- Variable with be depend over either

a. time

b. space (area)

c. volume

Example:

Time : The number of calls per Hour

space : The number of errors per page (Area)

Volume: The number of tablets in a water tank.

POISSON PROBLATY DISTRIBUTION

Formula

$$P(X=x) = \frac{e^{-\lambda}(\lambda)^x}{x!}$$

$x = 0, 1, 2, \ldots$

EXAMPLE 1:

The average number of calls per hour is 3. The number of calls follows poission probablity dist. If we select an hour randomly, Find the probility that λ the number of calls would be exactly 5

$P(X=5)=0.1008$

X	$\lambda = 3.0$
$x=5$ →	↓

$\lambda = 3$

(a) $P(X=5)$

$P(X=5)=?$

$P(X=5)=0.1008$

Table

X	$\lambda = 3.0$
$x=5$ →	↓

(b) P(less than 4) =

X	$\lambda = 3.0$
$x = 0 \to 3$	

$P(X<4)=?$

$P(X<4)=0.0498+0.1494+0.2240+0.2240.$

$P(X<4)= 0.6472$

(c) P(more than 6) =

$P(X \geq 6)=?$

$P(X \geq 6)= 0.0216+0.0081+0.0027+0.0008+$

$= 0.0002+0.0001$

$P(X \geq 6)= 0.0335$

(d) P(atleast 3) =

$P(X \geq 3) = P(3)+P(4)+ \cdots P(10)$

$=0.5767$

(e) P(at most 10) = ?

$P(x \leq 10)= P(0)+P(1)+P(2) \cdots P(10)$

$= 0.9996$

(f) P(from 2 to 7) =

$P(2 \leq x \leq 7)= 0.7888$

POISSION PROBABLITY DISTRIBUTION

Example 2:

The average number of errors per page is 4. If we select 2 pages randomly, find the probability that the number of errors would be exactly 7

$P(X=7) = ?$

Step #01: Per page $\lambda = 4$

Two page $\lambda = 2 \times 4 = 8$

$\lambda = 8$

	$\lambda = 8$
$x = 7$	0.1396

$P(X=7) = 0.3196$

27. (opt). Computer Help Hot Line recieves, on average, 6 calls per hour asking for assistance. The distribution is Poission. For any randomly selected Hour, find the Probablity that the company will recieve

a- At least 6 calls · $\lambda = 6$

$P(X) = ?$

$P(X \geq 6) = P(6) + P(7) + P(8)$

$P(X \geq 6) = 0.5542$

b- 4 or more calls

$P(X >= 4) = P(4) + P(5) + P(6) + \cdots$

$P(X >= 4) = 0.8488$

c- At most 5 calls (5-4)

$P(X \leq 5) = P(5) + P(4) + \cdots + P(0)$

$P(X \leq 5) = 0.4457$

Jaweria Asif (9442)

9- Study of robberies. A recent study of robberries for a certain geographic region showed an average of 1 robbery per 20,000 people. In a city of 80,000 people, find the probablity of the following

$4 \times 1 = 4$; $\lambda = 4$

a- 0 robberries

$P(0) = 0.0183$

b- 1 roberry

$P(1) = 0.0733$

c- 2 robberries

$P(2) = 0.1465$

d- 3 or more roberries

$P(x \geq 3) = P(3) + P(4) + P(5) + \cdots + P(14)$

$= 0.1954 + 0.1954 + \cdots + 0.00$

$= 0.7619$

We can't use direct Table to Normal distribution
We Transform it into standard
→ Previous 2 are discrete Normal distribution

Continuos

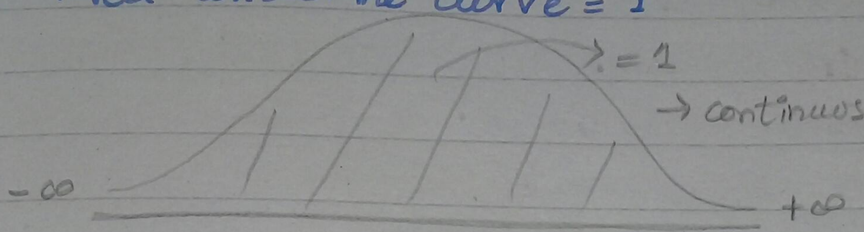
Pg# 784 & 785

NORMAL DISTRIBUTION:

Properties:

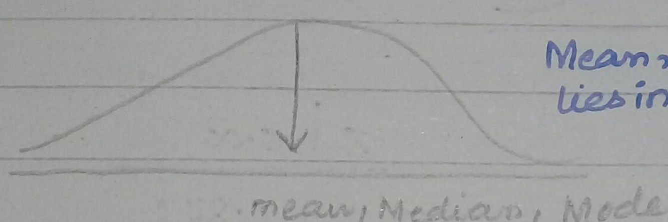
1- Continuos random Variable such as time, price, weight etc

2- Area under the curve = 1



3- $f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}} \quad -\infty < x < +\infty$

4-



Mean, Median, Mode lies in between

→ How to solve Problem?

We Transform

Normal distribution

Into standard normal distribution

$$z = \frac{x-\mu}{\sigma}$$

$P(X<x) \approx P(Z<z)$

Why we Transform?

To use z table