5 September 2023 Tuesday.

Group Data

→ Frequency Distribution

→ Dot plot, bar chart, Histogram, pie chart.

Example

Grade	freq	Σf
40-49	3	3
50-59	5	
60-69	6	
70-79	9	
80-89	8	
90-~~100~~	7	
~~total~~	38	

$\bar{X} = \frac{\text{sum}}{\text{Number}}$

$\text{Mean} = \frac{\Sigma [f \cdot m]}{\Sigma f}$

↑ for grop data

Mid point values = $\frac{\text{lower bound} + \text{upperbound}}{2}$

Grade	M.P
40-49	44.5
50-59	54.5
60-69	64.5
70-79	74.5
80-89	84.5
90-100	95

$\Sigma f = 3+5+6+9+8+7$

$= 38$

Grade	f	midpoint	f x midpoint	Cumulative Freq
40-49	3	44.5	133.5	3
50-59	5	54.5	272.5	8
60-69	6	64.5	387	14
70-79	9	74.5	670.5	23
80-89	8	84.5	676	31
90-100	7	95	665	38
	38		2804.5	

$$\text{mean} = \frac{\Sigma f \times \text{midpoint}}{\Sigma f}$$

$$= \frac{2804.5}{38} = 73.8$$

★ 73.8 marks are average (most students got 73.8 marks)

★ Mode = 70-79 because highest frequency is in this range most students lie in this range

★ $\frac{1}{2}$ (~~Cumulative~~ total) = median = $\frac{1}{2} \times 38 = 19$

★ 19 lies in (15-23) in C.F i.

The median also lies in range of (70 to 79)

05/september/2023

⇒ Grouped Data

⇒ Construction of Frequency Distribution

⇒

Step #1 : find range of data i.e max - min

Step #2 : find the number of classe i.e bins or number of groups - To calculate no. of classes ⇒

(no. of classes) $K = 1 + 3.3 \log(N)$ ∴ N = samples (total)

Step #3 : Interval or class size : range ÷ K

range = $X_{max} - X_{min}$

$K = 1 + 3.3 \log(N)$

Interval = range / K

(i) Example : $X_{max} = 98$, $X_{min} = 10$

Range = 98 - 10 = 88.

→ The data is dispersed on 88 (maximum)

(ii) $K = 1 + 3.3 \log(60) = 6.86 \approx 7$

(iii) h (interval) $= \frac{88}{7} = 12.75 \approx 13$

Notes- Class limits should not be overlapping & clearly defined

Class Limits	f	Tally
10 - 22	3	III
23 - 35	4	IIII
36 - 48	5	IIIII
49 - 61	8	IIIIIIII
62 - 74	14	IIIIIIIIIIIIII
75 - 87	20	IIIIIIIIIIIIIIIIIIII
88 - 100	6	IIIIII
$\Sigma f =$	60	

* Class boundaries is not original data.

original data	f	Rf	Pf	C.f	mid	mp*f	fx^2	class boundaries
10-22	3	0.05	5%	3	16	48	768	9.5 - 22.5
23-35	4	0.067	6.67%	7	29	116	3364	22.5 - 35.5
36-48	5	0.083	8.33%	12	42	210	8820	35.5 - 48.5
49-61	8	0.133	13.3%	20	55	440	24200	48.5 - 61.5
62-74	14	0.233	23.3%	34	68	952	64736	61.5 - 74.5
75-87	20	0.33	33.3%	54	81	1620	131220	74.5 - 87.5
88-100	6	0.1	10%	60	94	564	53016	87.5 - 100.5
Σf	60	≈1	≈100%			3950	286124	

frequency distribution

$$\bar{x} = \frac{\Sigma (f \times m.p)}{\Sigma f} = \frac{3950}{60} = 65.833 = \frac{\Sigma f x}{\Sigma f}$$

$$\text{Std. dev} = \sqrt{\frac{\Sigma f x^2}{\Sigma f} - \left(\frac{\Sigma f x}{\Sigma f}\right)^2}$$

$$= \sqrt{\frac{\Sigma f x^2}{60} - (65.83)^2} = \sqrt{\frac{286124}{60} - (65.83)^2}$$

→ class boundries used to make difference of intervals same.

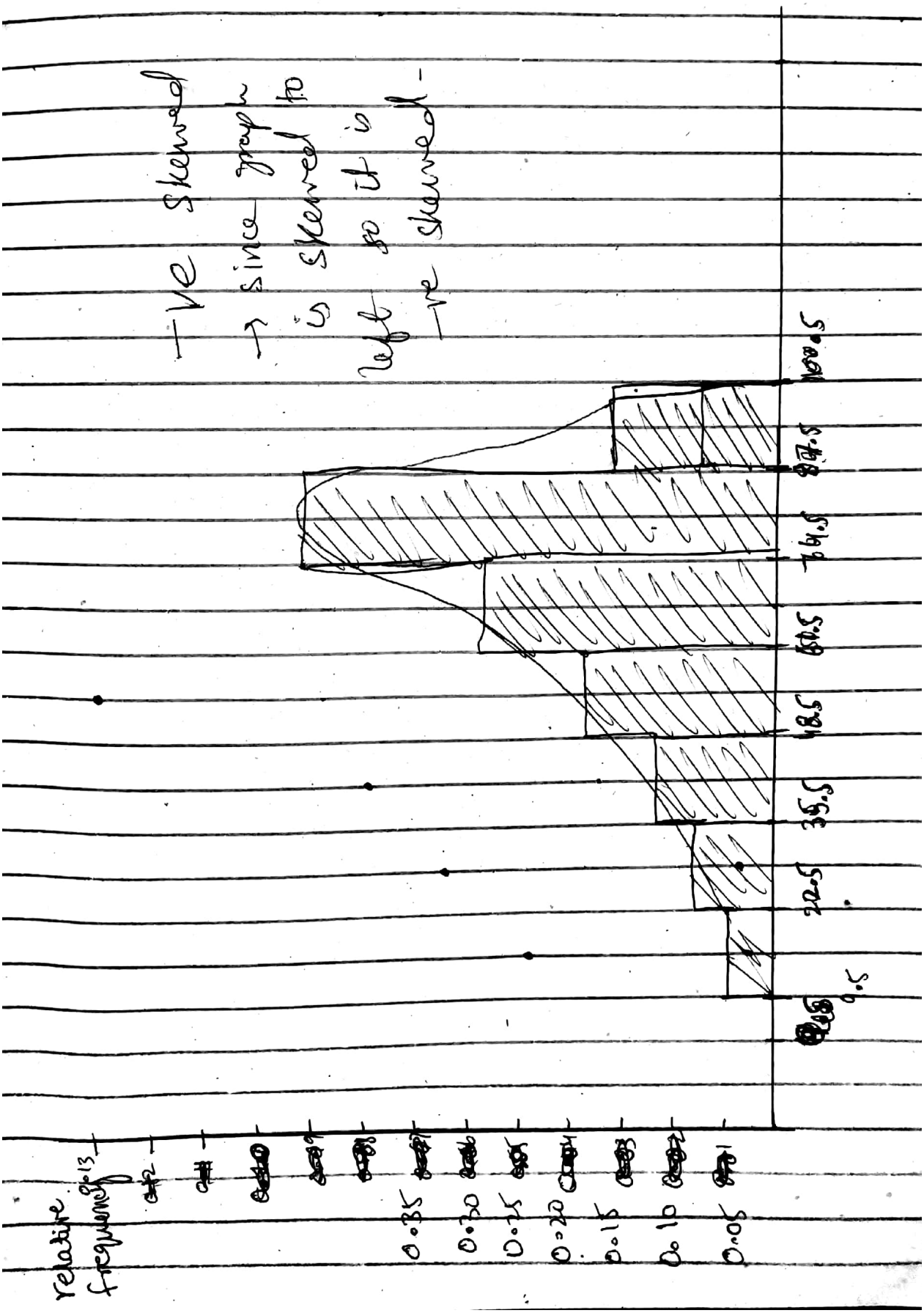
→ To make class boundaries, subtract 0.05 (from 2df) from ub and lb

→ x-axis of midpoints or intervals of class boundary

→ Y-axis of frequency or R.f

Sk

-ve skewed
→ since graph is skewed to left so it is -ve skewed.

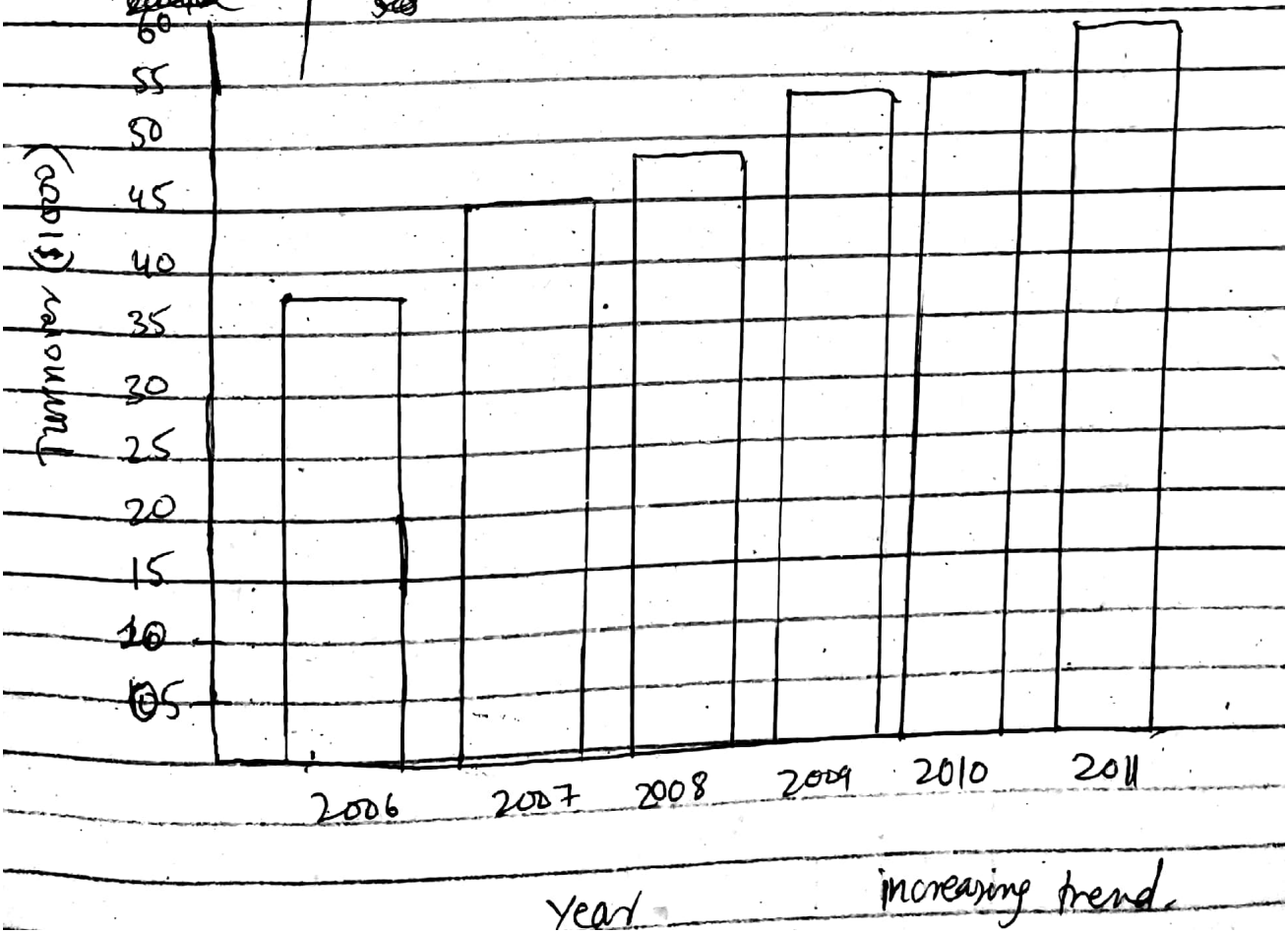


7 September 2023 Thursday

Bar Chart

→ Draw simple bar chart to represent the turnover of a company for 6 years

Years	Turnover ($) (1000 Thousand)
2006	38
2007	45
2008	48
2009	52
2010	55
2011	58.5



increasing trend.

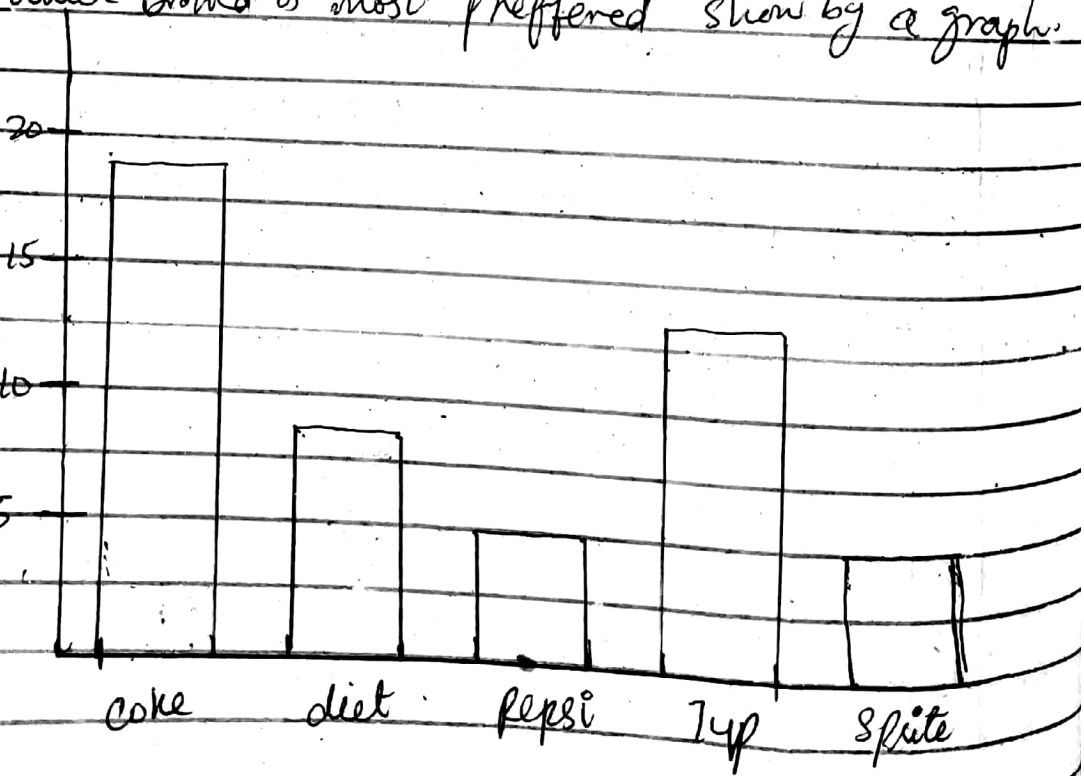
Bar Chart

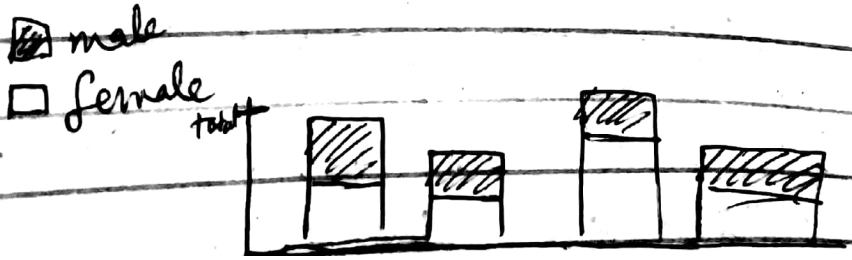
Example :-

IQ frequency dist. of soft drink purchases

Soft drink	f
Coke	19
diet coke	8
Pepsi	5
7up	13
Sprite	5
~~Fanta~~	50

→ which brand is most preffered show by a graph.





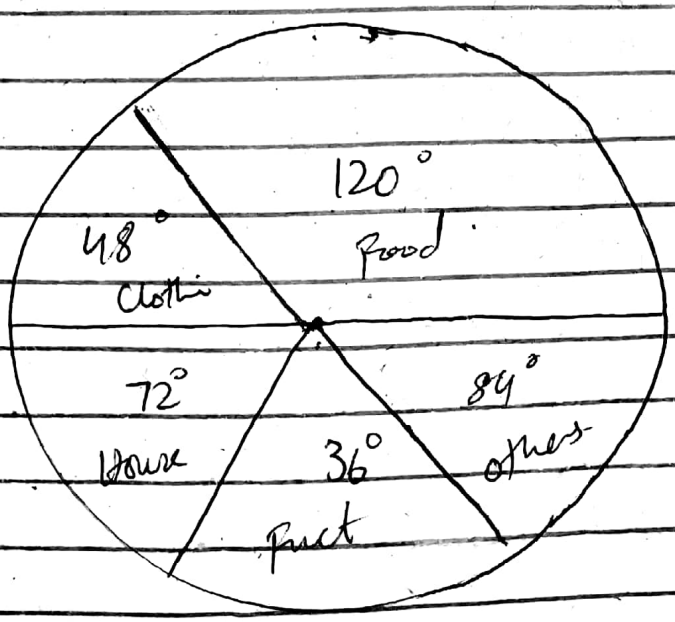
*component barchart

Pie Chart

Pie chart → Sector Diagram
→ Pizz - slice diagram

Expenditure on different items including expense of a family by a pie - chart :-

Items	$(1000) Expenditure		
Food	~~20~~ 50	=	~~%~~ % 120
Clothing	~~5~~ 30	=	~~%~~ % 79.4
House Rent	20	=	~~%~~ % 49.65
Fuel - Energy	15	=	~~%~~ % 37.24
Others	35	=	86.89 %
	150		

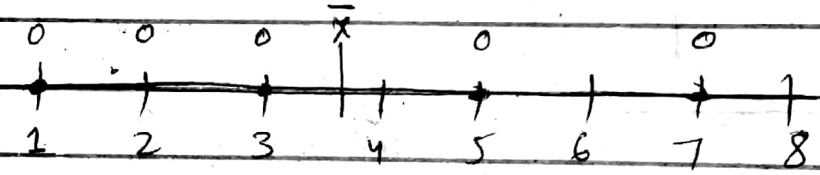


Exercise 1.1 :: Q# 1.3, 1.2, 1.6, Practice

Number Line / Dot-Plot

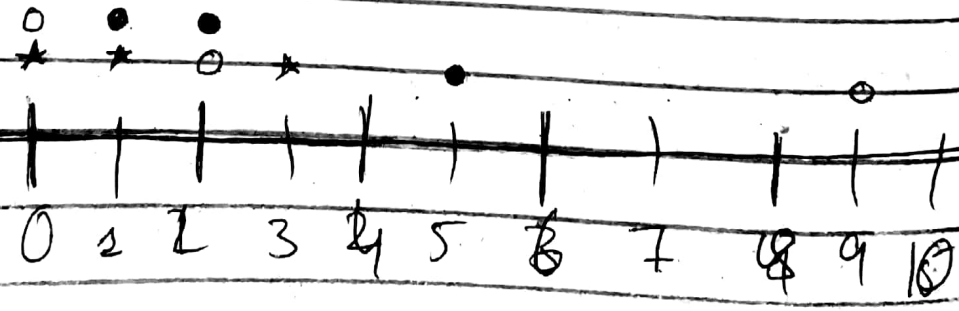
IQ

x	y
a	1
b	3
c	5
d	7
e	2



→

x	y	z	x̂	ŷ	ẑ
a	b	c	0	2	5
d	e	f	1	9	2
g	h	i	3	0	1



⇒ Probability intro
⇒ Statistical experiment / random experiment
⇒ Events
⇒ Set Theory / Venn diagram
⇒ Tree Diagram
⇒ Counting Sample Points