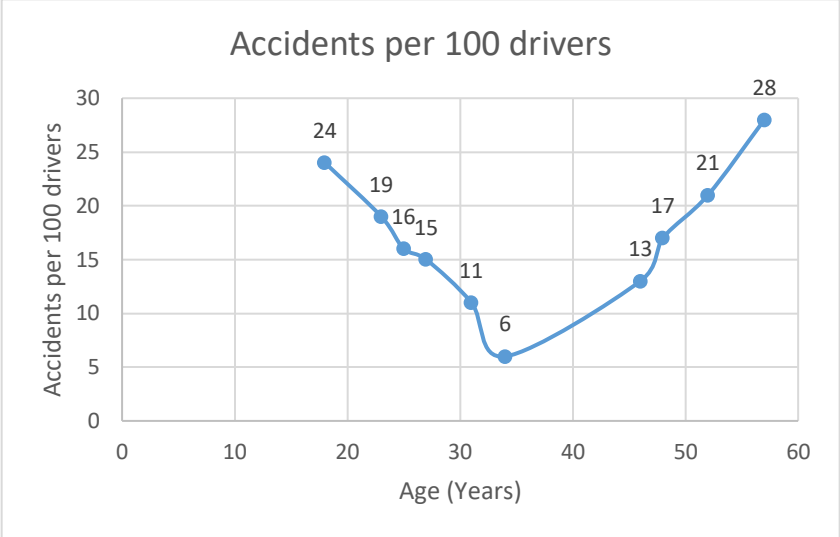
1. Scatter Plots

1. **Create a Scatter Plot for the following data**

Age (Years)	Accidents per 100 drivers
18	24
23	19
25	16
27	15
31	11
34	6
46	13
48	17
52	21
57	28

Sol:

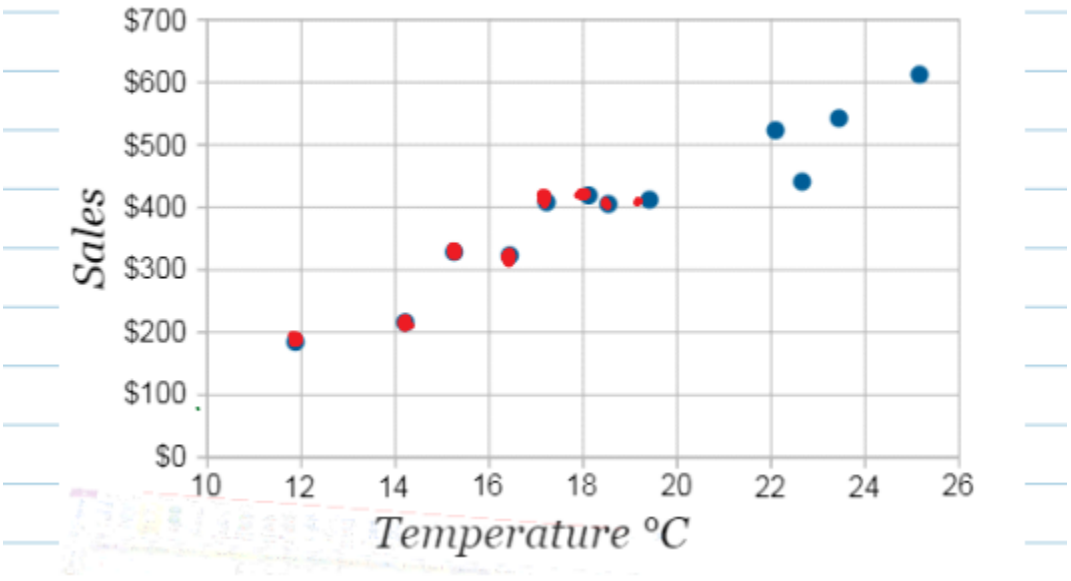


2. **Create a scatter plot for the following data**

The local ice cream shop keeps track of how much ice cream they sell versus the noon temperature on that day. Here are their figures for the last 12 days:

Ice Cream Sales vs Temperature	
Temperature °C	**Ice Cream Sales**
14.2°	$215
16.4°	$325
11.9°	$185
15.2°	$332
18.5°	$406
22.1°	$522
19.4°	$412
25.1°	$614
23.4°	$544
18.1°	$421
22.6°	$445
17.2°	$408

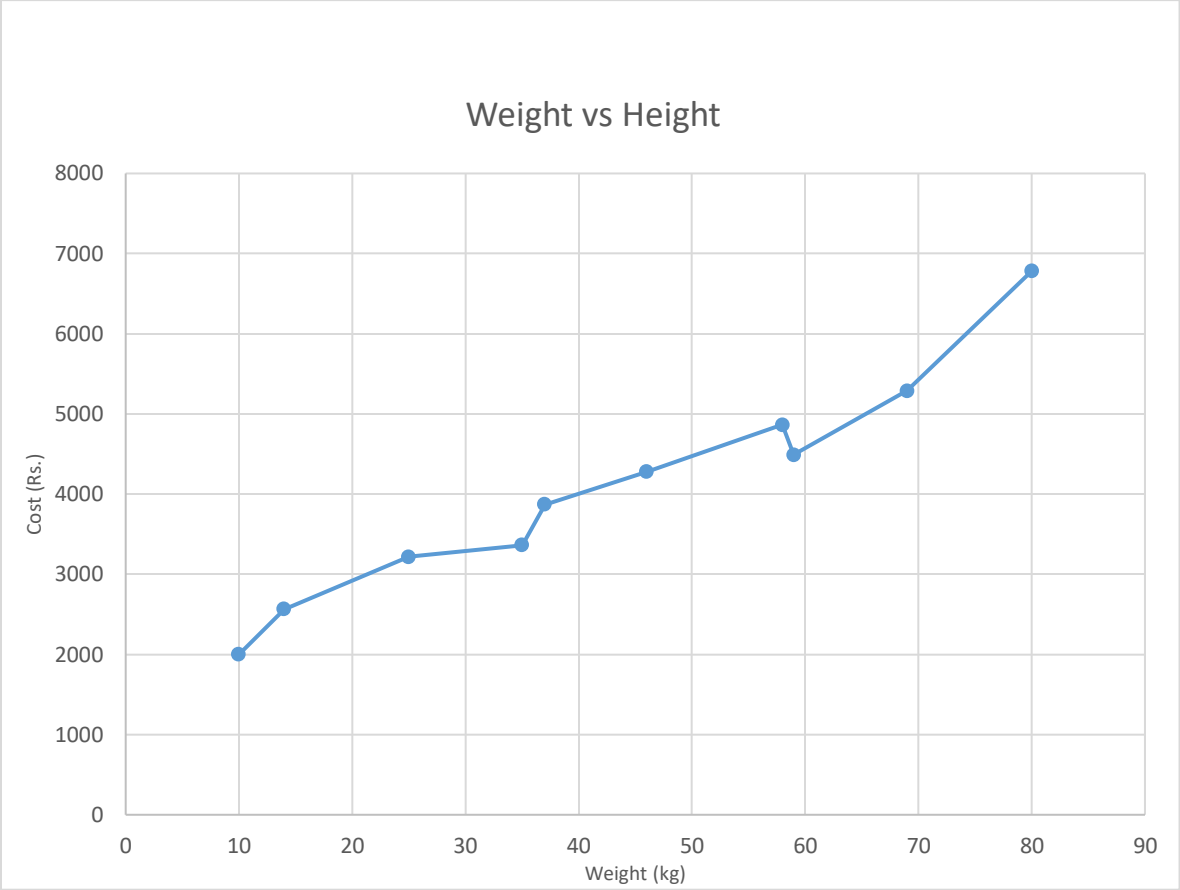
Sol:



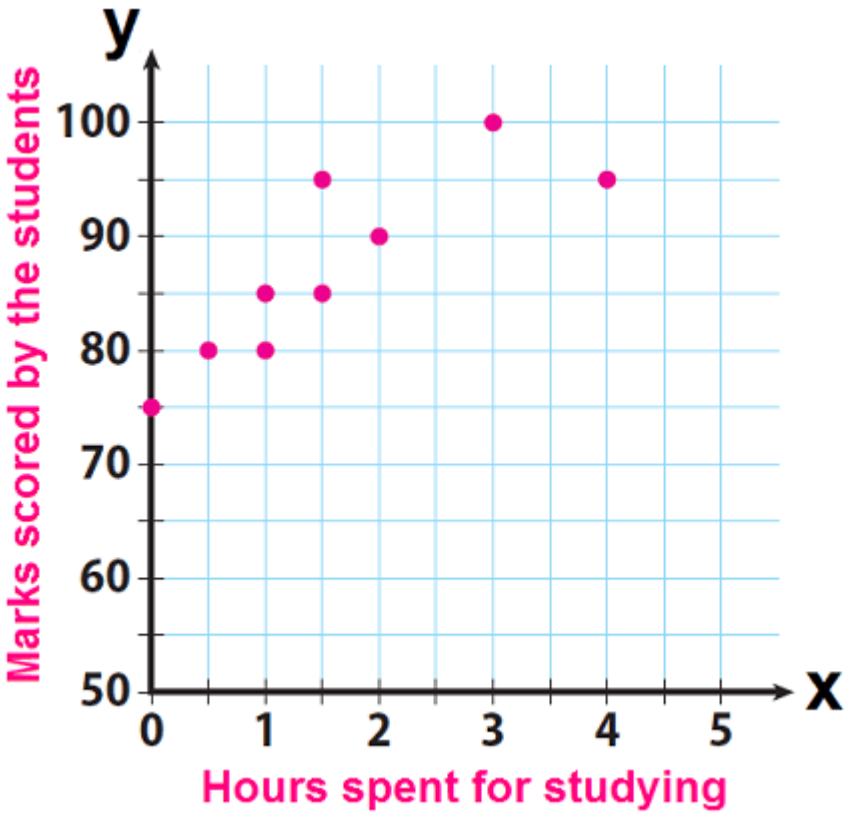
3. Create a scatter Plot for the following data

Weight (kg)	Cost (Rs.)
10	2000
14	2563
25	3216
35	3362
37	3872
46	4278
58	4863
59	4489
69	5289
80	6782

Sol:



4. Consider the following diagram and answer the questions



1. What was the lowest marks scored by the students?
2. How many hours did the student who scored highest study?
3. What is the overall trend in the followed by the graph?
4. How much did the student who studied for 2 hours earn?

Sol:

1. **75**
2. **3**
3. **Positive Correlation, generally if no. of hours increase then marks scored also increased**
4. **90**

2. Stem and Leaf Plot

1.

Q Create stem & leaf plot for foll. data

01, 06, 1, 20, 25, 25, 36, 4, 5, 6, 7, 8, 92, 95, 99

Sol:

Stem	leaf
0	1 6
1	
2	0 5 5
3	6
4	
5	
6	
7	
8	
9	2 5 9

2.

Sam got his friends to do a long jump and got these results

2.3, 2.5, 2.5, 2.7, 2.8 3.2, 3.6, 3.6, 4.5, 5.0

Sol:

Stem	Leaf
2	3 5 5 7 8
3	2 6 6
4	5
5	0

3.

Answer the questions about the stem and leaf plot shown below.

Stem and Leaf Plot

4	1
5	2 7 8
6	5 6
7	0 5 8 8 8
8	0 0
9	5

How many data entries are there?

What is the range of the data set?

List all entries less than 60.

4.

101, 131, 114, 102, 125, 101, 115, 103, 120, 122

stem	leaf
10	1 1 2 3
11	4 5
12	0 2 5
13	1

Key:
10 | 3 = 103

Minimum value = 101

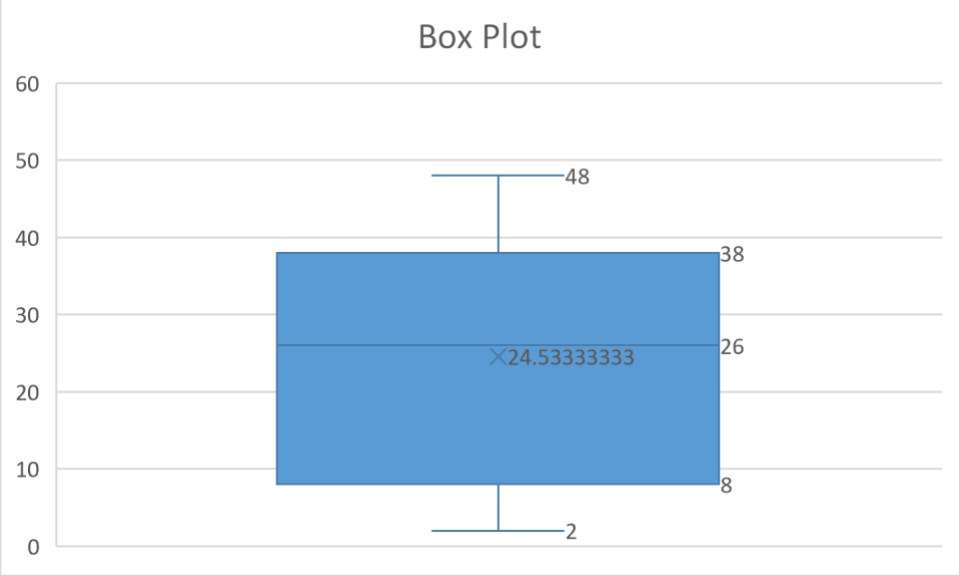
Maximum value = 131

Modal value = 101

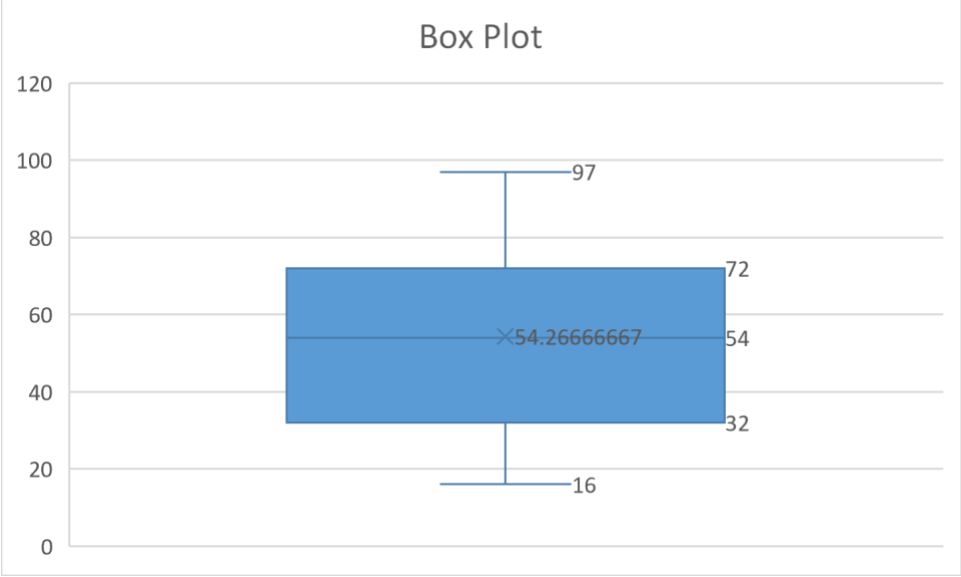
3. Box Plot

1. **Create a Box Plot for the following data**

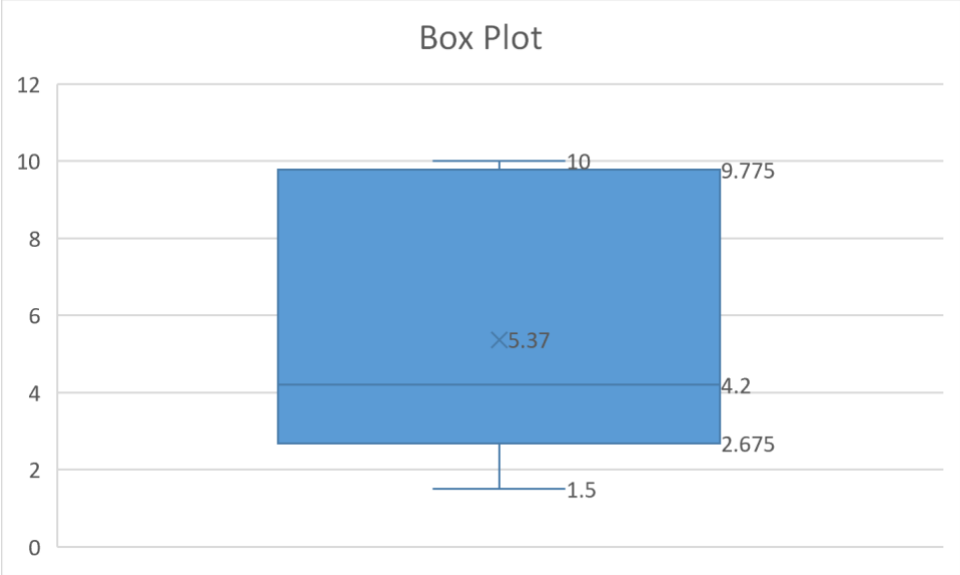
2, 6, 7, 8, 9, 16, 24, 26, 29, 31, 35, 38, 42, 47, 48



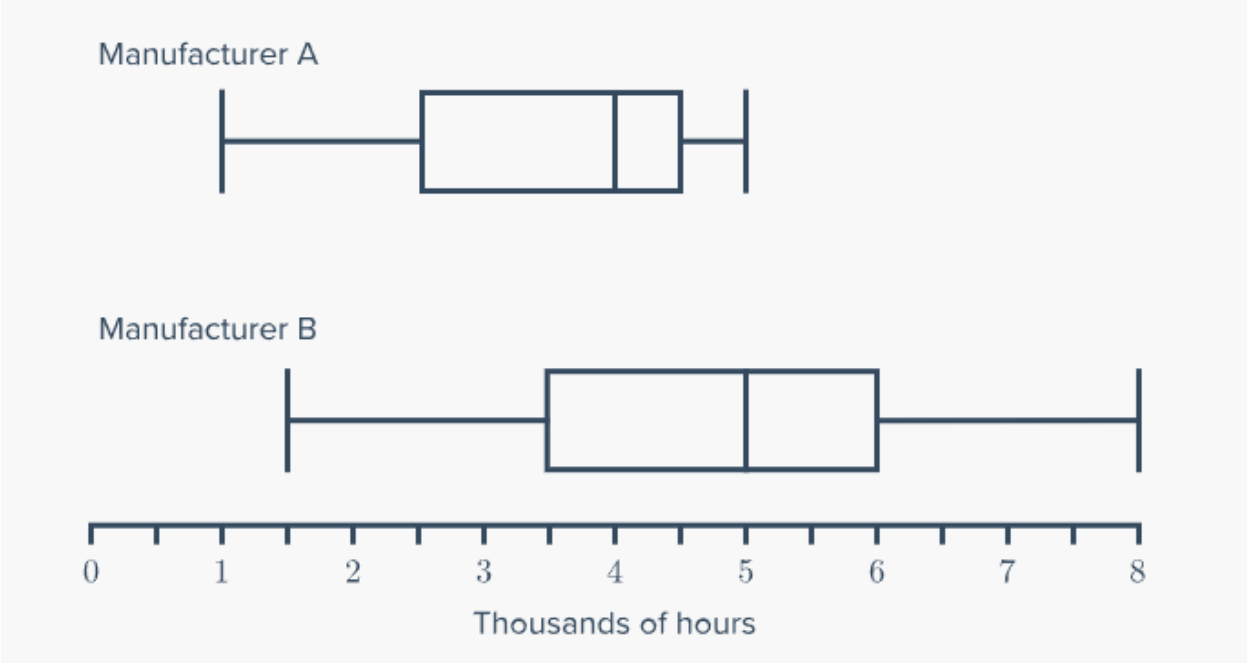
2. **Create a Box Plot for the following data**
   63 31 17 32 94 16 45 97 54 55 72 71 32 85 50



3. **Create a Box Plot for the following data**
   10, 3, 1, 10, 3, 6, 10, 1, 2, 2



4. **The two box plots below show the data collected by the manufacturers on the life-span of light bulbs, measured in thousands of hours.**



Answer the following questions

1. Which manufacturer's bulbs shows more consistent results?
2. Which manufacturer's bulb life span had a higher inter-quartile range?
3. How much longer was Manufacturer B's highest bulb life-span in comparison to Manufacturer A's?
4. Find the 5 number summary for both plots

Sol:

1. Manufacturer A, since its range is smaller and so results are more consistent with less variation

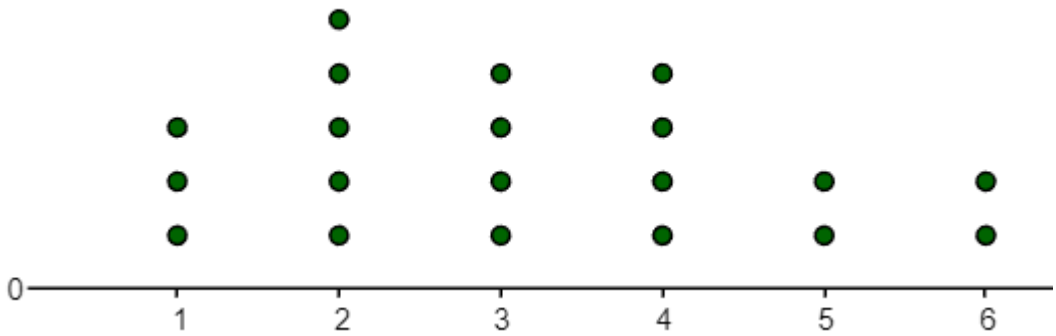
2. Manufacturer B (interquartile range=2.5)
3. The maximum lifespan of a bulb is represented by the end point of the right whisker.
   8-5=**3**
4. **Manufacturer A**
   Min= 1
   Q1=2.5
   Median= 4
   Q3= 4.5
   Max=5

   Manufacturer B
   Min= 1.5
   Q1=3.5
   Median= 5
   Q3= 6
   Max=8

4. Dot Plot

1. A Die is rolled 20 times. Create a dot plot for the following data

Face of Dice	Frequency
1	3
2	5
3	4
4	4
5	2
6	2



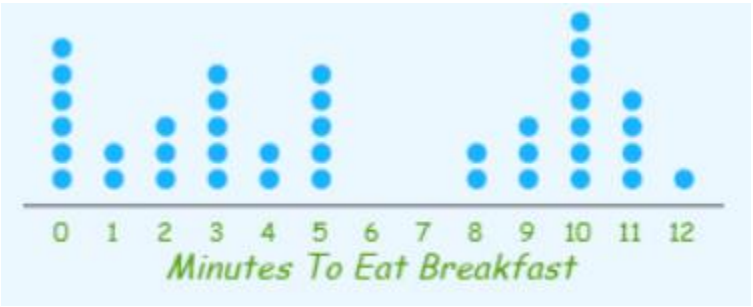
Sol:

2.

A survey of "How long does it take you to eat breakfast?" has these results:

Minutes:	0	1	2	3	4	5	6	7	8	9	10	11	12
People:	6	2	3	5	2	5	0	0	2	3	7	4	1

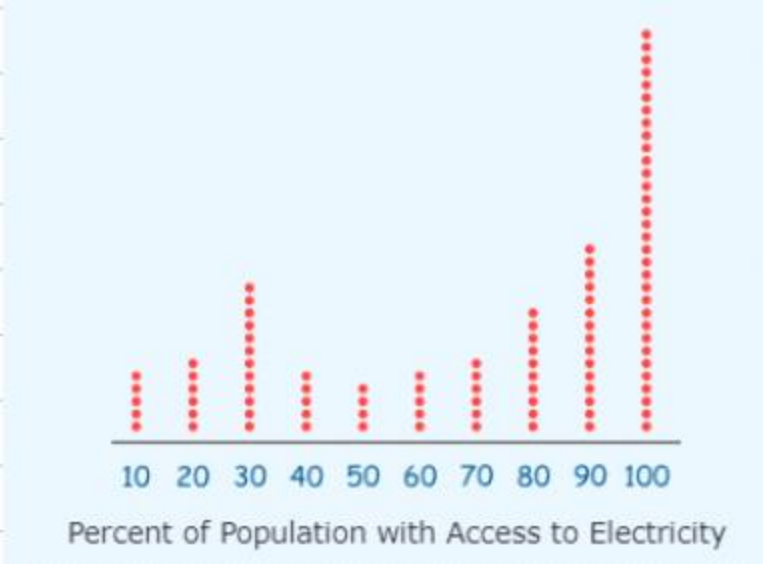
Sol:



3.

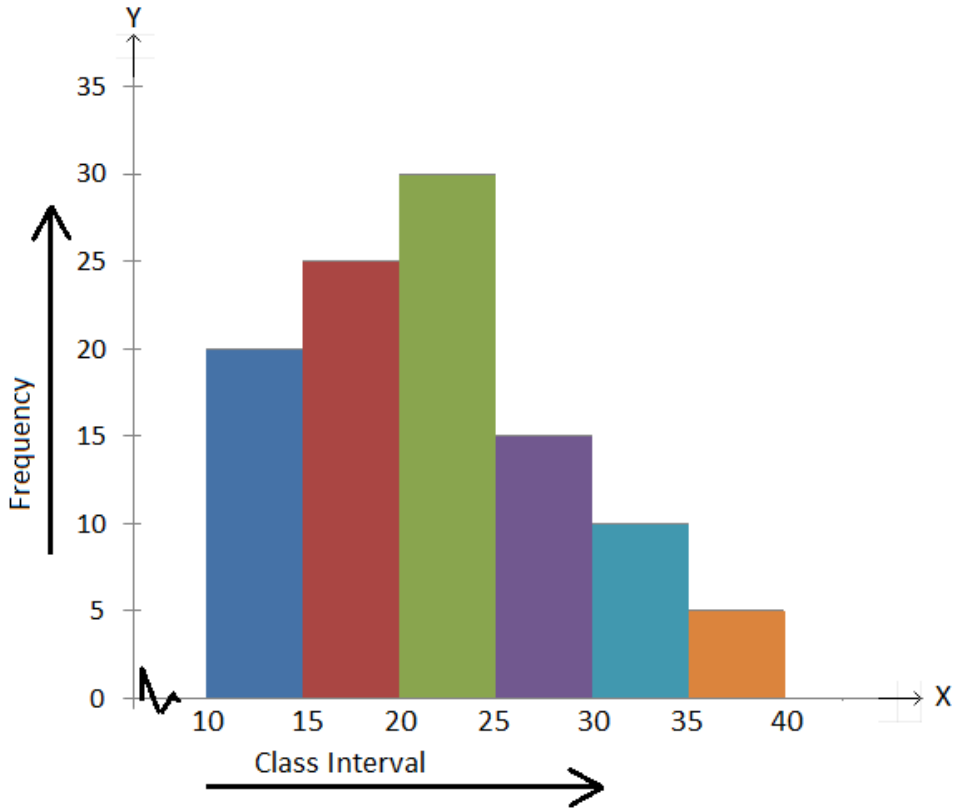
Access to Electricity (% of population, nearest 10%)	Number of Countries
10	5
20	6
30	12
40	5
50	4
60	5
70	6
80	10
90	15
100	34

Sol:



5. Histogram

1. Answer the following questions



i. Which class has the maximum and minimum frequency?
ii. Draw a frequency distribution table for the above graph
iii. What is the cumulative frequency for the class 25-30

iv. What is the total number of observations?

Sol:

i. Minimum Frequency- Class interval 35-40
Maximum Frequency- Class interval 20-25

ii. Frequency Distribution Table

Class	**Frequency**
10-15	20
15-20	25
20-25	30
25-30	15
30-35	10
35-40	5

iii. Cumulative Frequency of 20-25 is 20+25+30=75

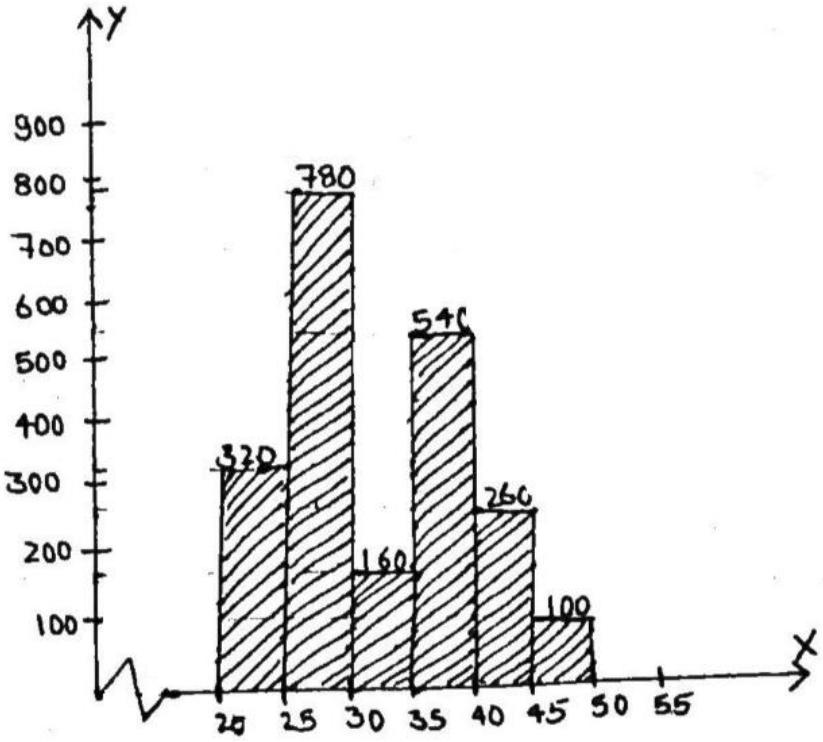
iv. Total observations= 20+25+30+15+10+5=105

2. **Draw a histogram for the following data**

Class interval	$20-25$	$25-30$	$30-35$	$35-40$	$40-45$	$45-50$
Frequency	320	780	160	540	260	100

Given:

Class Interval	20-25	25-30	30-35	35-40	40-45	45-50
Frequency	320	780	160	540	260	100



3. **Construct a histogram**

Class interval	5 – 9	10 – 14	15 – 19	20 – 24
Frequency	3	5	4	2

Sol:

The given frequency distribution is grouped but not continuous. So, first we will make them regular.

Lower limit of 2nd class interval =10;

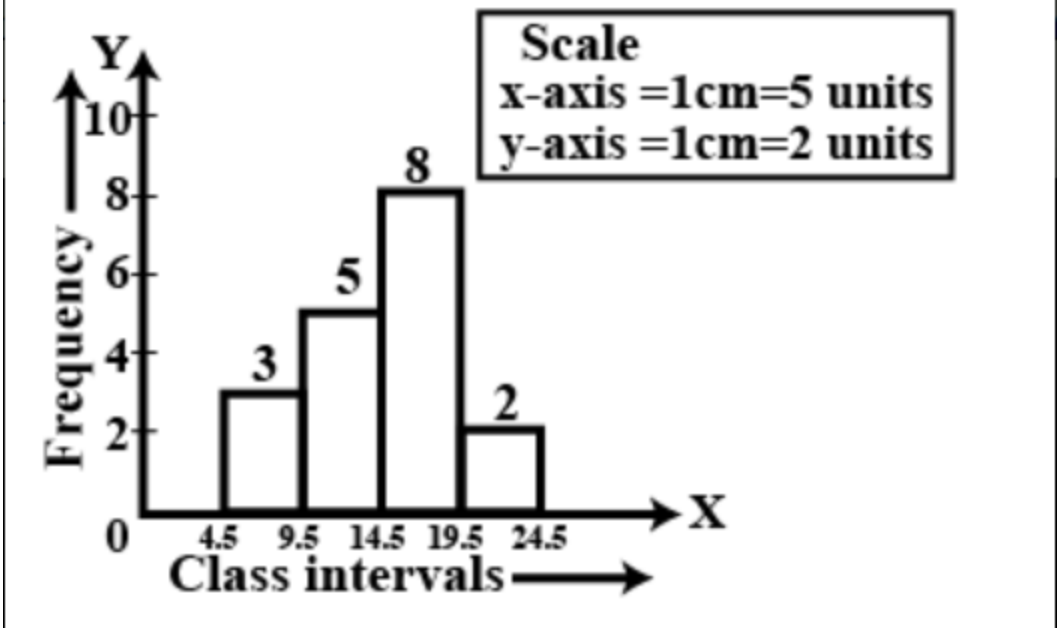
Upper limit of 1st class interval =9

Difference (h)= 10−9=1

$\Longrightarrow$ h/2= ½= 0.5

We subtract 0.5 from the lower limits and add 0.5 in the upper limits to make the class intervals regular.

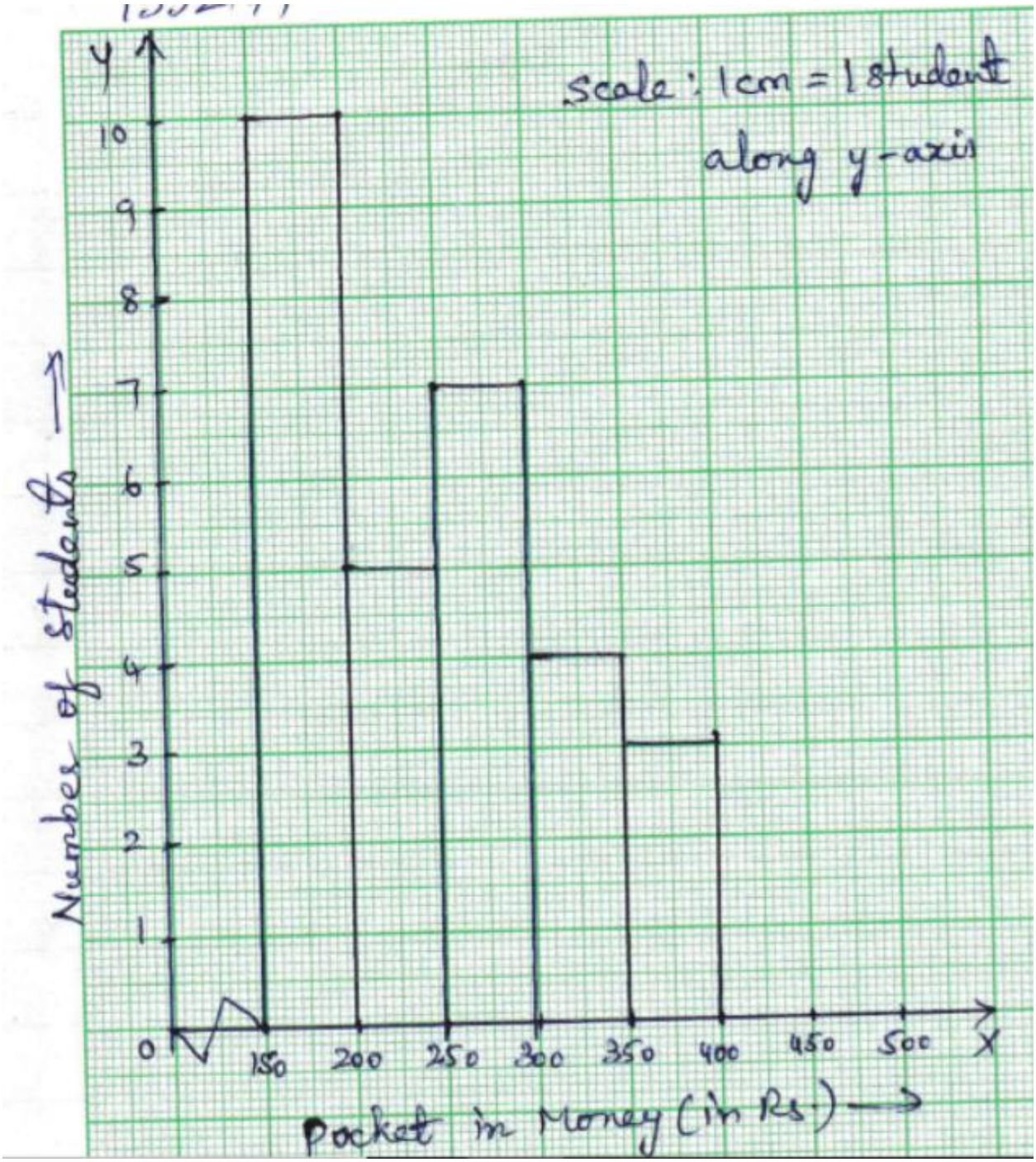
Class interval	4.5-9.5	9.5-14.5	14.5-19.5	19.5-24.5
Frequency	3	5	8	2



4. Draw a histogram to represent the following data

Pocket money (in Rs)	150 – 200	200 – 250	250 – 300	300 – 350	350 – 400
Number of students	10	5	7	4	3

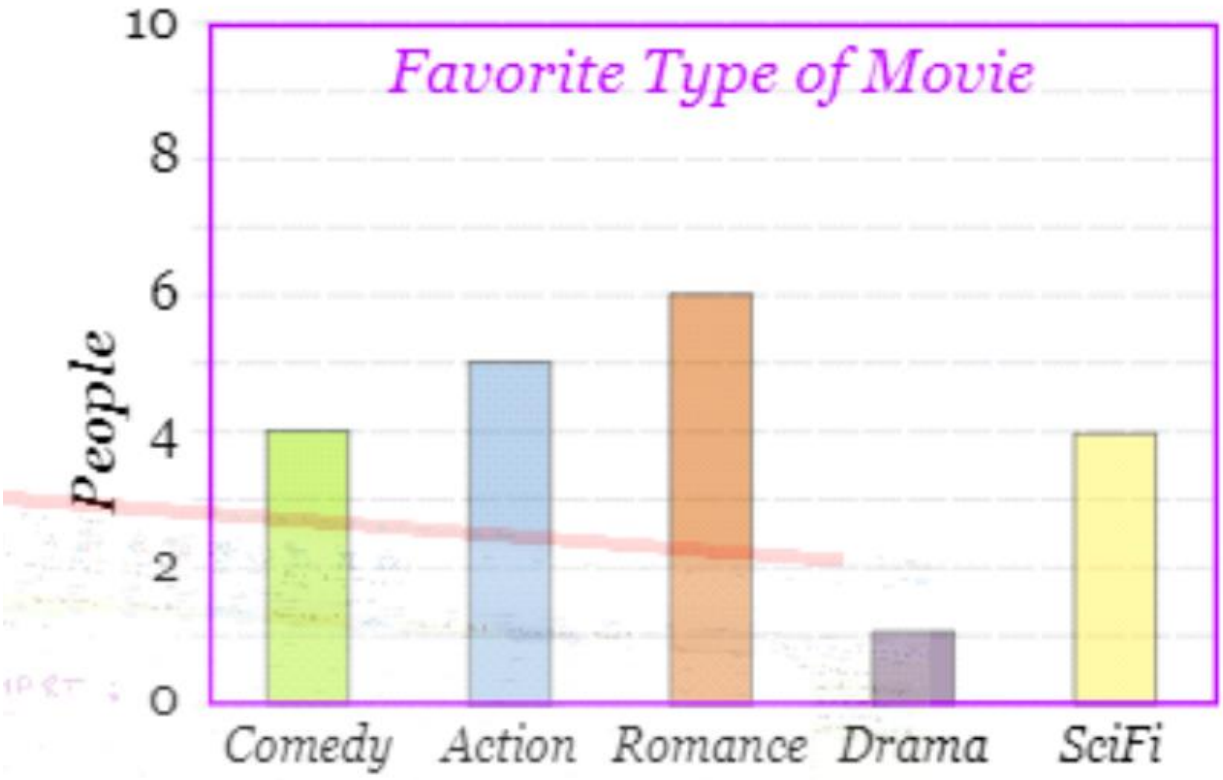
Sol:



6. Bar chart

1. **Draw a bar chart**

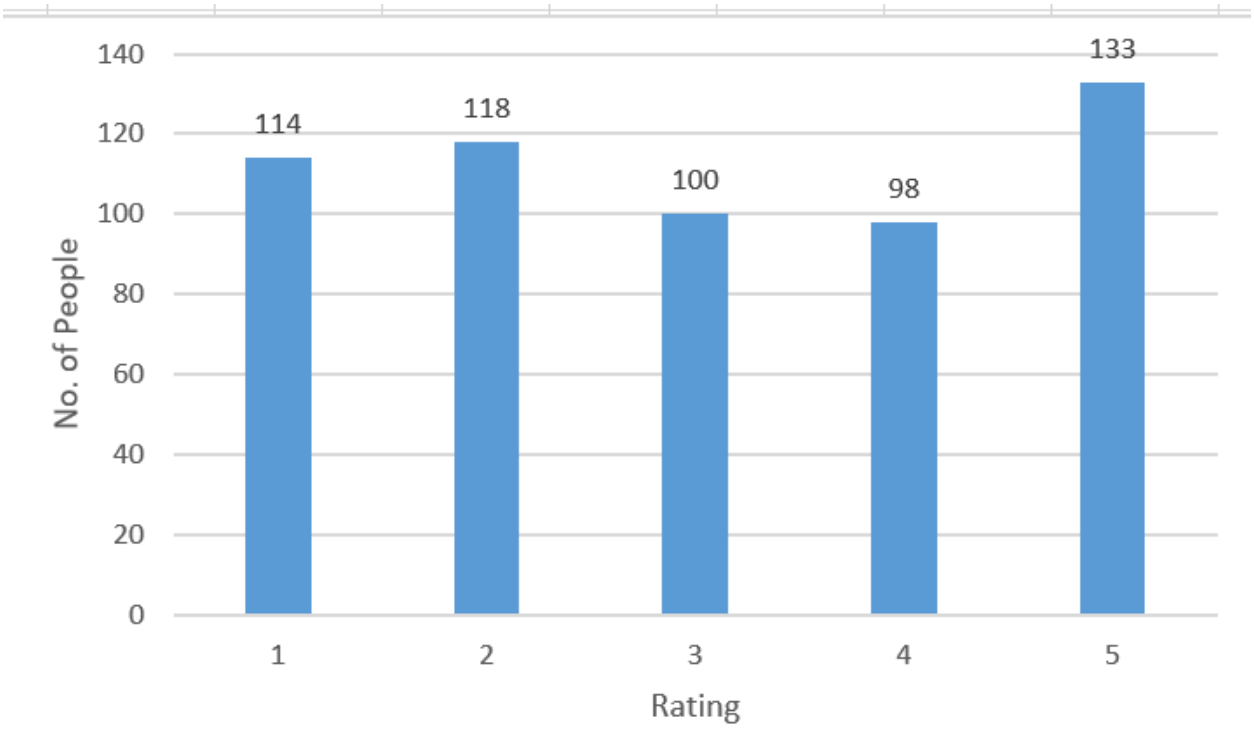
Comedy	Action	Romance	Drama	SciFi
4	5	6	1	4



2. The following dataset represents the ratings given by people for a particular service. Draw a bar chart for the following

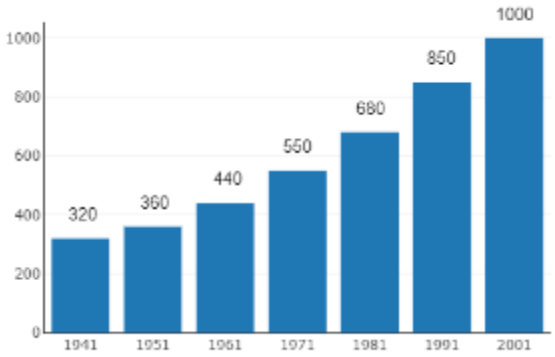
Rating	No. People
1	114
2	118
3	100
4	98
5	133

Sol:

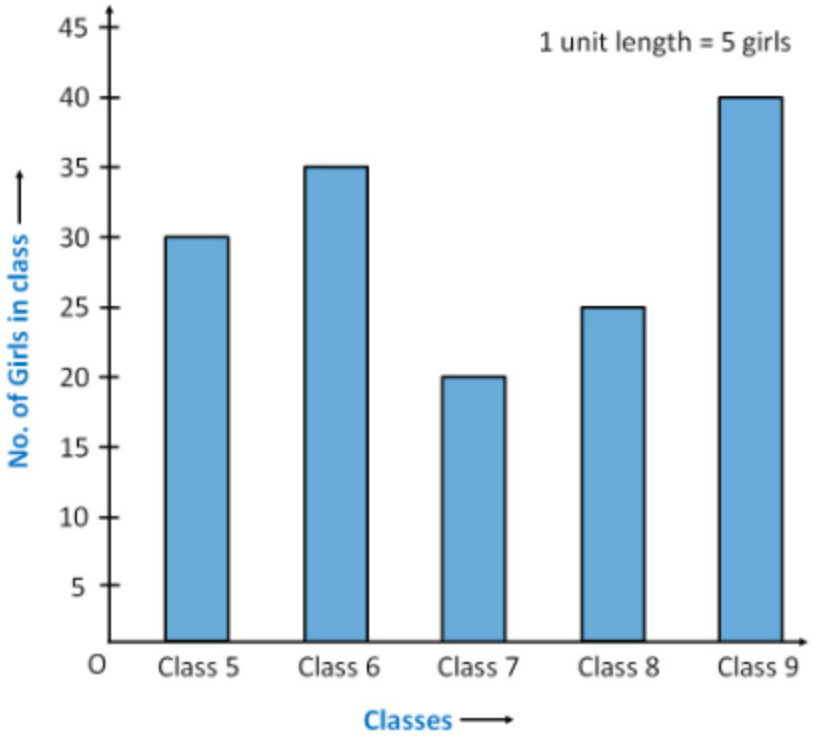


3. Draw a Bar Graph

Year	1941	1951	1961	1971	1981	1991	2001
Population (in millions)(approx.)	320	360	440	550	680	850	1000



4. Answer the following questions



1. Which class has the maximum no. of girls?
2. What is the difference in the no. of girls between the class with the maximum number and the class with the minimum number?
3. How many girls are there in class 6?
4. What is the total number of girls in all classes?

Sol:

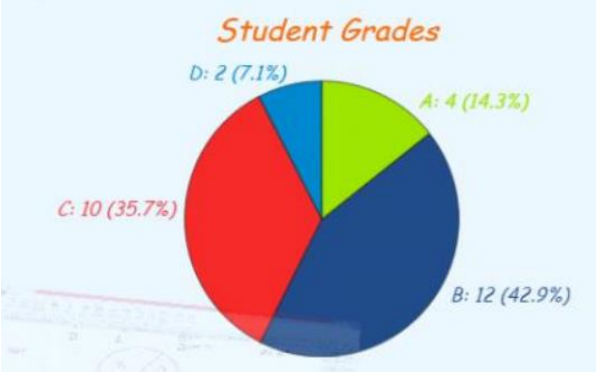
1. Class 9
2. 40-20=20
3. 35
4. 150

7. Pie Chart

1. Draw a Pie Chart for student grades

A	B	C	D
4	12	10	2

Sol:

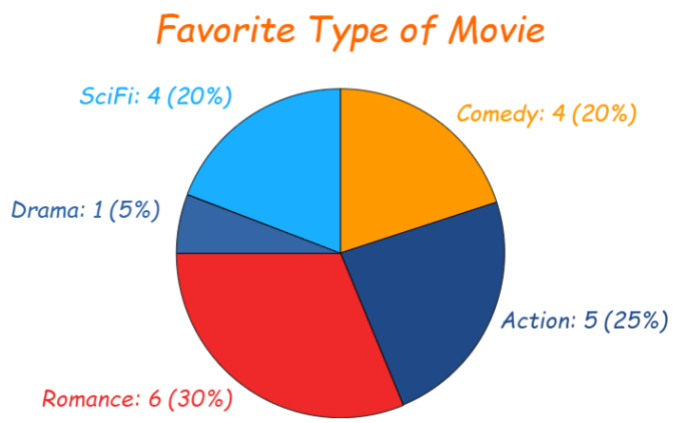


2. **Draw a Pie Chart**

Table: Favorite Type of Movie				
Comedy	**Action**	**Romance**	**Drama**	**SciFi**
4	5	6	1	4

Sol:

Comedy	Action	Romance	Drama	SciFi	TOTAL
4	5	6	1	4	**20**
20%	**25%**	**30%**	**5%**	**20%**	**100%**
4/20 × 360° = **72°**	5/20 × 360° = **90°**	6/20 × 360° = **108°**	1/20 × 360° = **18°**	4/20 × 360° = **72°**	**360°**



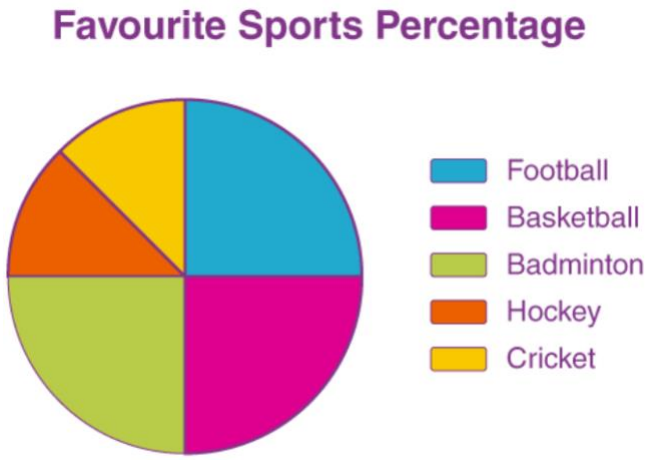
3. **Draw a Pie Chart**

Football	Hockey	Cricket	Basketball	Badminton
10	5	5	10	10

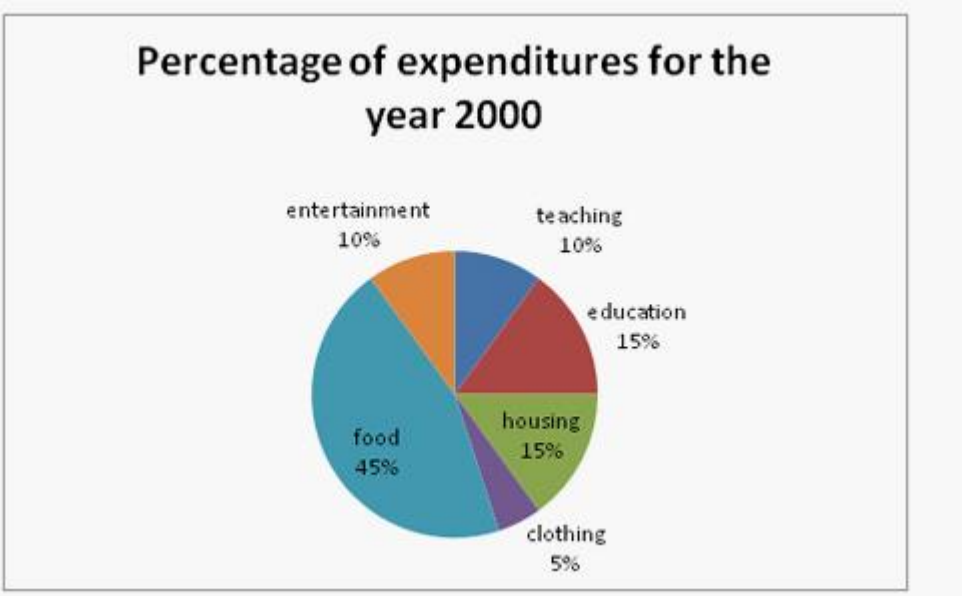
Sol:

Football	Hockey	Cricket	Basketball	Badminton
(10/40) × 100 =25%	(5/ 40) × 100 =12.5%	(5/40) ×100 =12.5%	(10/ 40) ×100 =25%	(10/40)× 100 =25%

Football	Hockey	Cricket	Basketball	Badminton
(10/ 40)× 360° =90°	(5 / 40) × 360° =45°	(5/40) × 360° =45°	(10/ 40)× 360° =90°	(10/ 40) × 360° =90°



4. Answer the following



1. If the total amount that was spent in the year2000 was Rs. 48000, the amount that was spent on housing and clothing combined was
2. The ratio of the amount spent on teaching and education to clothing and food was what?
3. According to the graph, the maximum amount that was spent was on which item?
4. If the amount spent on food was Rs. 22500, what was the total expenditure?

Sol:

1. Amount spent on Clothing and Housing together = (15% + 5% = 20%) of 48000 = Rs. 9600/-.
2. Required Ratio = 25% of total amt. / 50% of total amt. = ½
3. Food
4. 22500/45%=50000

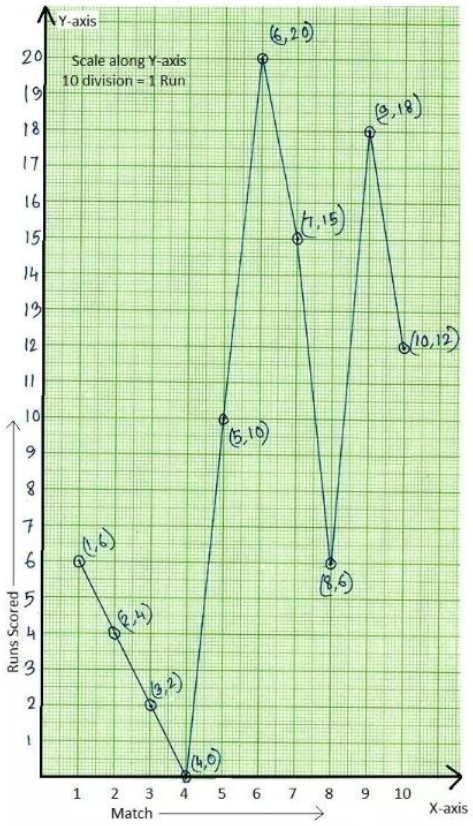
8. Line Graph/ Time Series Graph

1. Draw a line graph

   The following are the runs scored by a team in the first 5 overs:

Match	1	2	3	4	5	6	7	8	9	10
Runs Scored	6	4	2	0	10	20	15	6	18	12

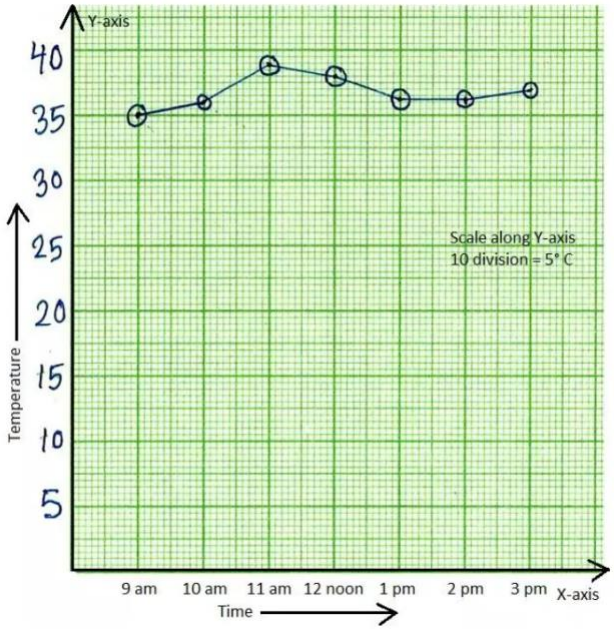
   Sol:



2. The following tables give the information about a patient's body temperature recorded in the hospital every hour.

Time	9 am	10 am	11 am	12 noon	1 pm	2 pm	3 pm
Temperature	35° C	36° C	39° C	38°C	36.5° C	36.5° C	37° C

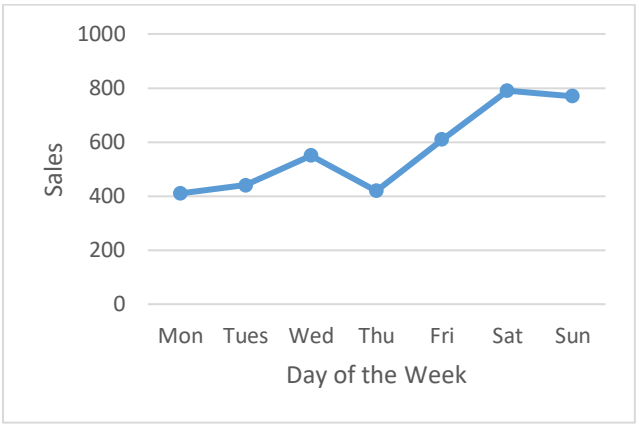
   Sol:



3. Draw a line graph

Mon	Tue	Wed	Thu	Fri	Sat	Sun
$410	$440	$550	$420	$610	$790	$770

Sol:

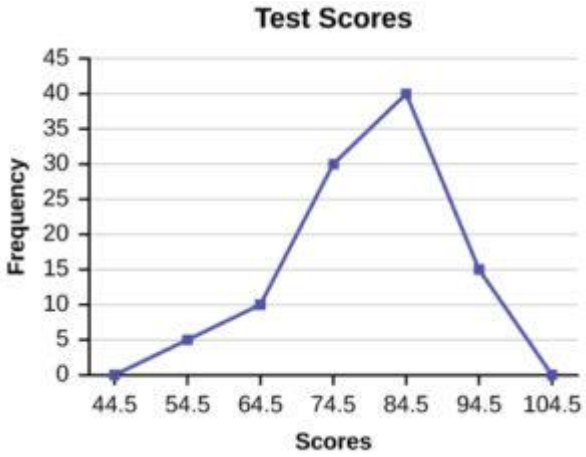


9. Frequency Polygon

1. Construct a frequency polygon using the data given below

Test Scores	Frequency
49.5-59.5	5
59.5-69.5	10
69.5-79.5	30
79.5-89.5	40
89.5-99.5	15

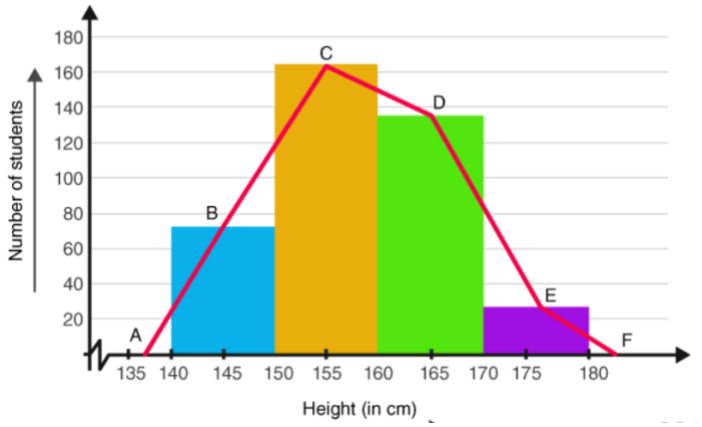
Ans:



2. In a batch of 400 students, the height of students is given in the following table. Represent it through a frequency polygon.

Height (in cm)	Number of Students(Frequency)
140 – 150	74
150 – 160	163
160 – 170	135
170 – 180	28
Total	400

Sol:



10. Exponential Graphs

1. Find the equation which fits the data

X	Y
2	28
3	62
4	110
5	161

Sol:

x	y	log10x	log10y	xsquare	xy
2	28	0.30103	1.447158	0.090619	0.435638
3	62	0.477121	1.792392	0.227645	0.855188
4	110	0.60206	2.041393	0.362476	1.229041
5	161	0.69897	2.206826	0.488559	1.542505
		2.079181	7.487768	1.169299	4.062372

$y = ax^b$

$\log_{10} y = \log_{10} a + b * \log_{10} x$

The Normal equations are

$\Sigma y = nA + B\Sigma X$

$\Sigma xy = A\Sigma X + B\Sigma x^2$

$A = 0.8320$, $B = 2.0005$
0.8716 1.9244 ✓

$\log_{10} a = 0.8716$ $\quad b = 1.9244$

$a = 10^{0.8716}$

$= 7.4404$

$y = ax^b = 7.4404\, x^{1.9244}$