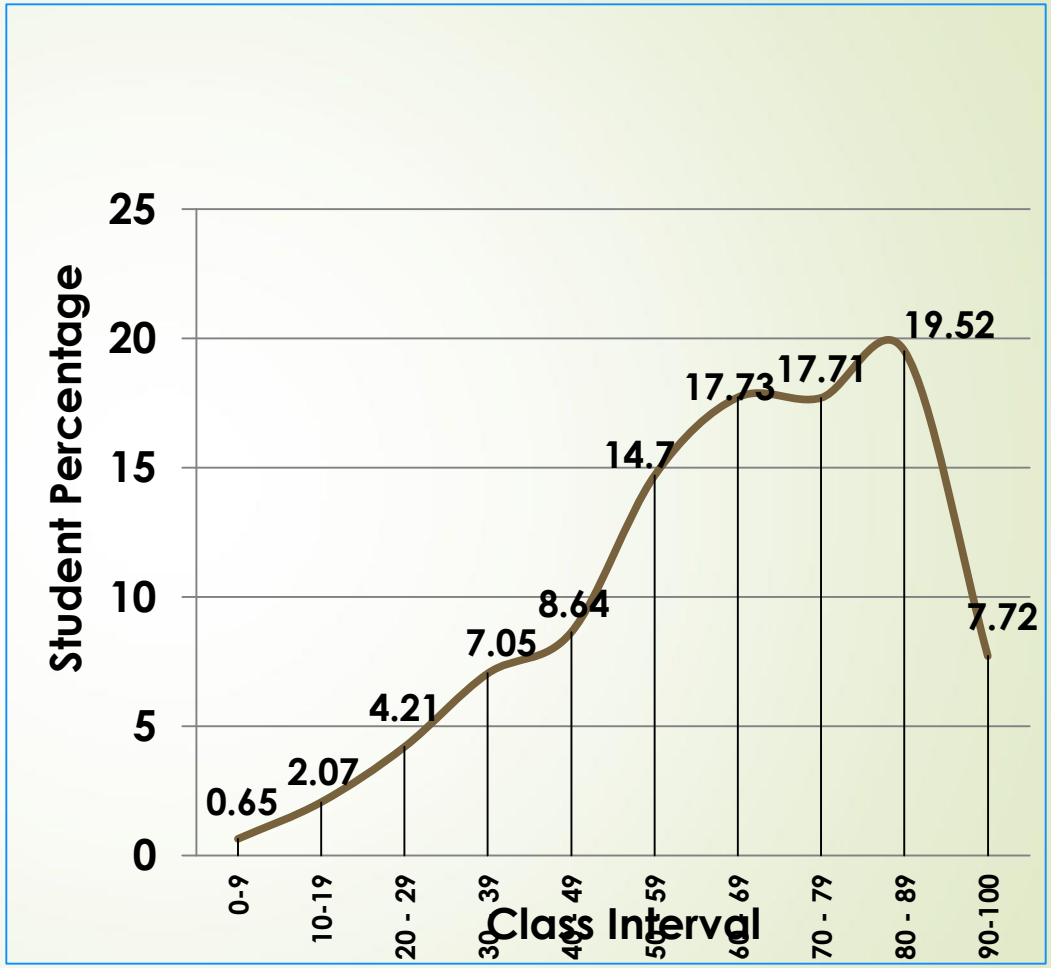
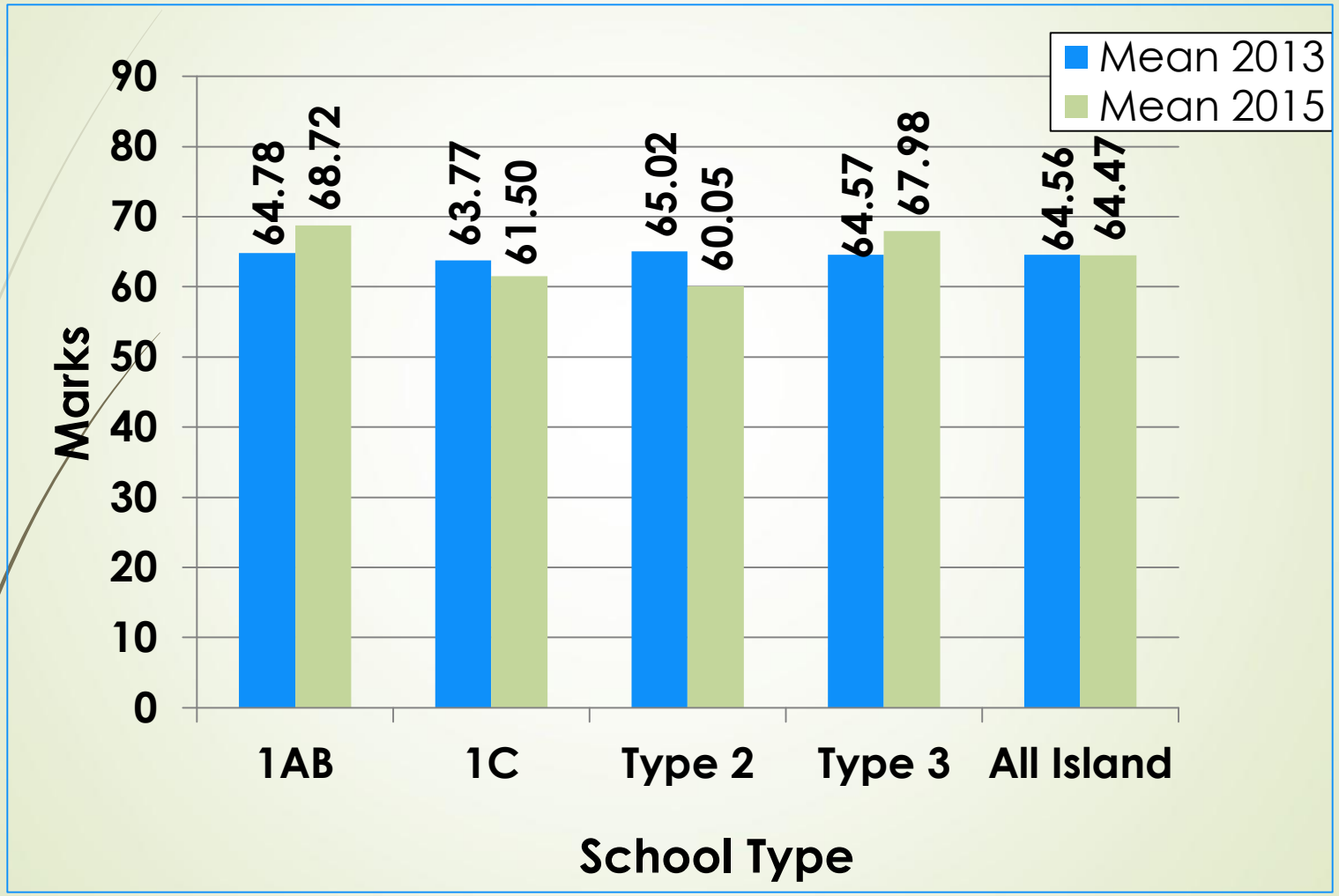
Graphic Representation of Test Scores (Construction of graphs)

Patterns of achievement at national level

Class Interval	Student %	Cumulative %
0 –9	0.65	0.65
10 - 19	2.07	2.73
20 - 29	4.21	6.94
30 - 39	7.05	13.99
40 - 49	8.64	22.62
50 - 59	14.70	37.33
60 - 69	17.73	55.06
70 - 79	17.71	72.77
80 - 89	19.52	92.28
90 - 100	7.72	100.00
Total	100.00	



Comparison of marks according to school type



The importance of graphically representing scores

Graphic Representation of Test Scores (Construction of graphs)

Histogram

Frequency Polygon

Cumulative frequency percentage curve-Ogive

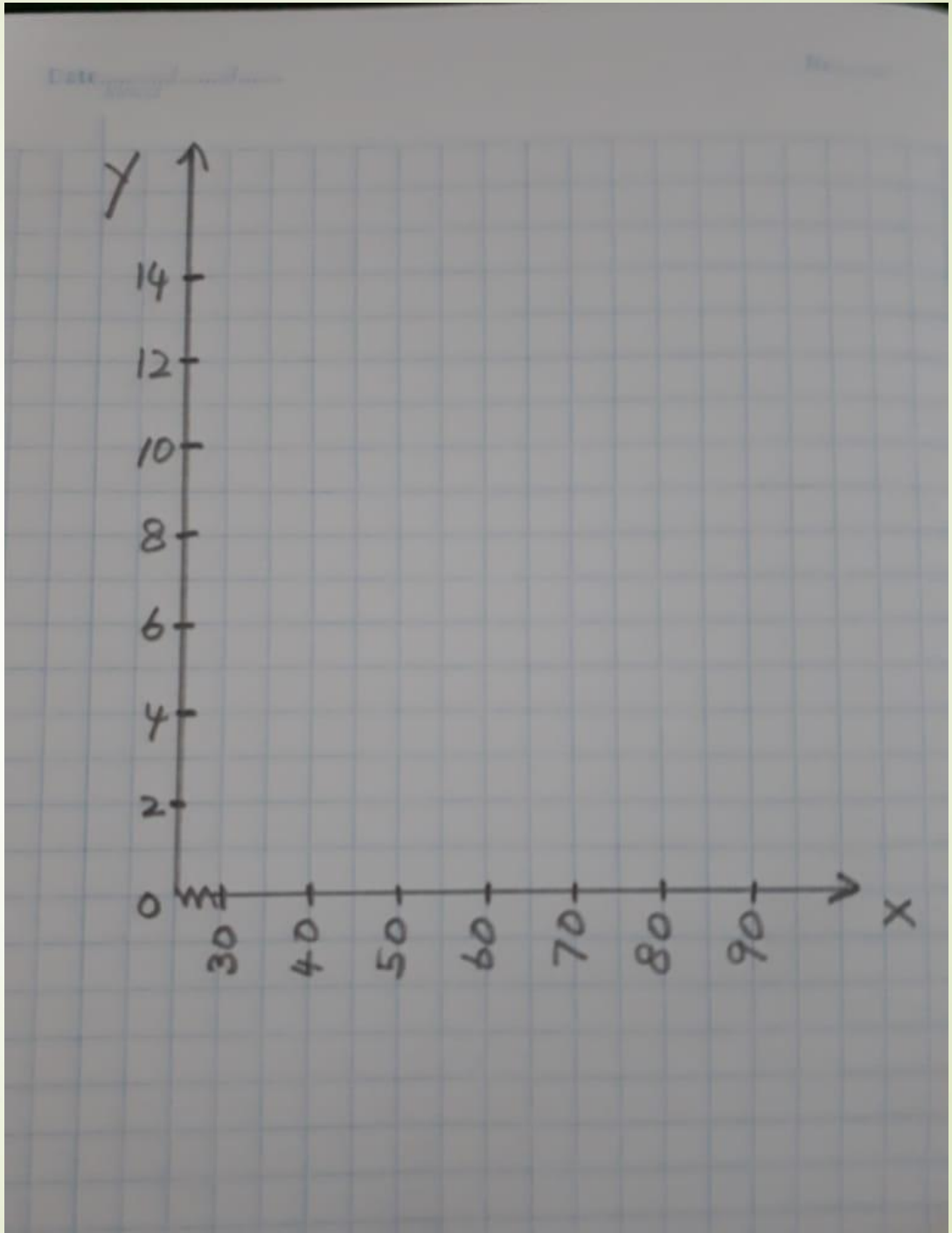
Identification of the two variables

independent

dependent

Marking the axis of the graph

Suggest a topic to the graph


Y
14
12
10
8
6
4
2
0
30
40
50
60
70
80
90
X

CI	F	Mid value	Real limits	CF	CF%
80-84	3	82	79.5-84.5	40	100
75-79	2	77	74.5-79.5	37	92.5
70-74	1	72	69.5-74.5	35	87.5
65-69	3	67	64.5-69.5	34	85
60-64	5	62	59.5-64.5	31	77.5
55-59	9	57	54.5-59.5	26	65
50-54	6	52	49.5-54.5	17	42.5
45-49	4	47	44.5-49.5	11	27.5
40-44	2	42	39.5-44.5	7	17.5
35-39	3	37	34.5-39.5	5	12.5
30-34	2	32	29.5-34.5	2	5

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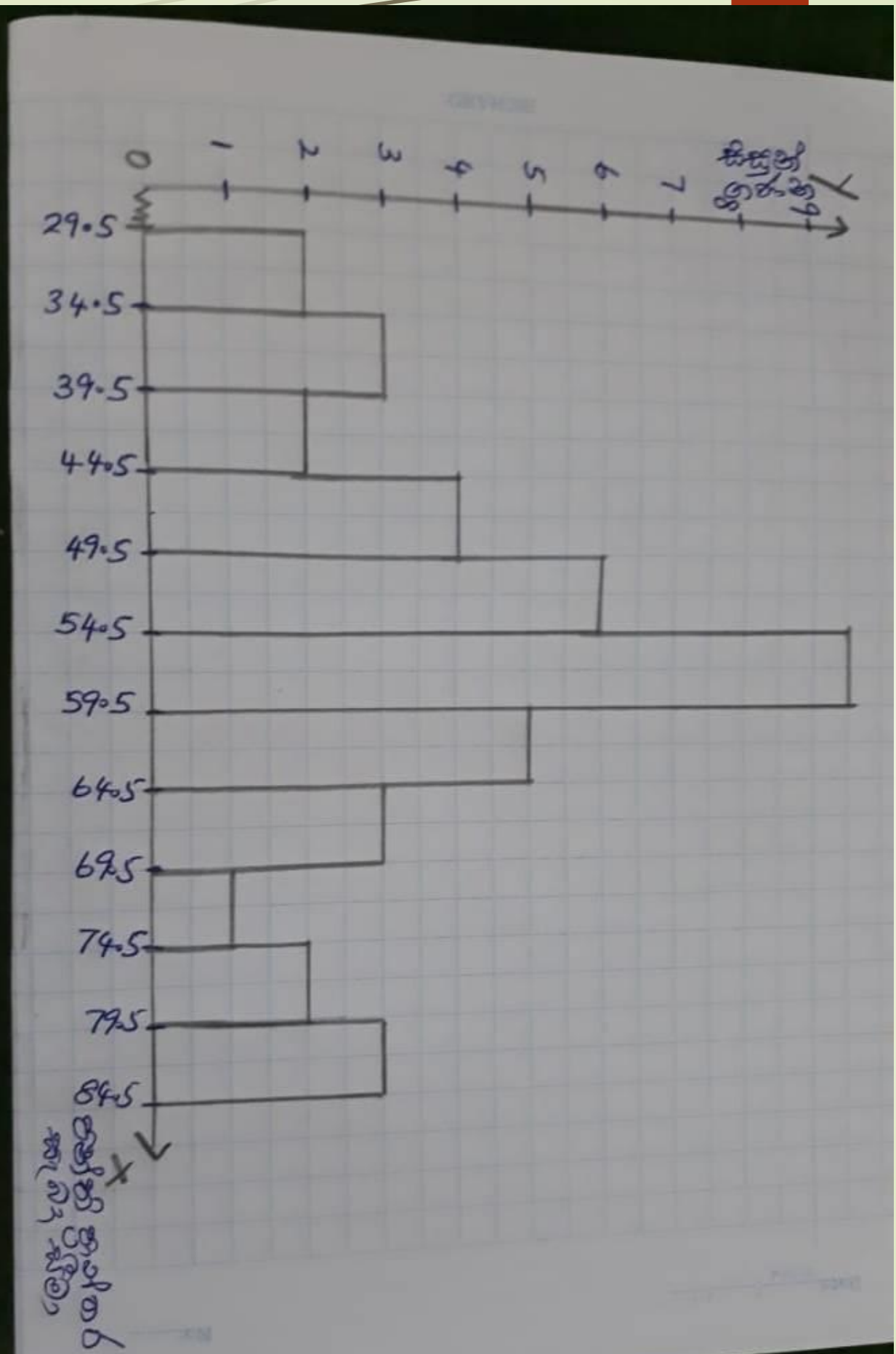
Histogram

- **frequencies are plotted on the vertical axis beginning from zero.**
- **Real limits of the classes are plotted on the horizontal axis.**
- **Start X axis with the lower limit of the lowest class interval. When the lower limit happens to be a distant score from the origin give a break in the X-axis to indicate that the axis has been moved in for convenience.**
- **Rectangle bars are drawn through the real limits of the classes on the horizontal axis with the height proportional to the frequency of the respective class.**



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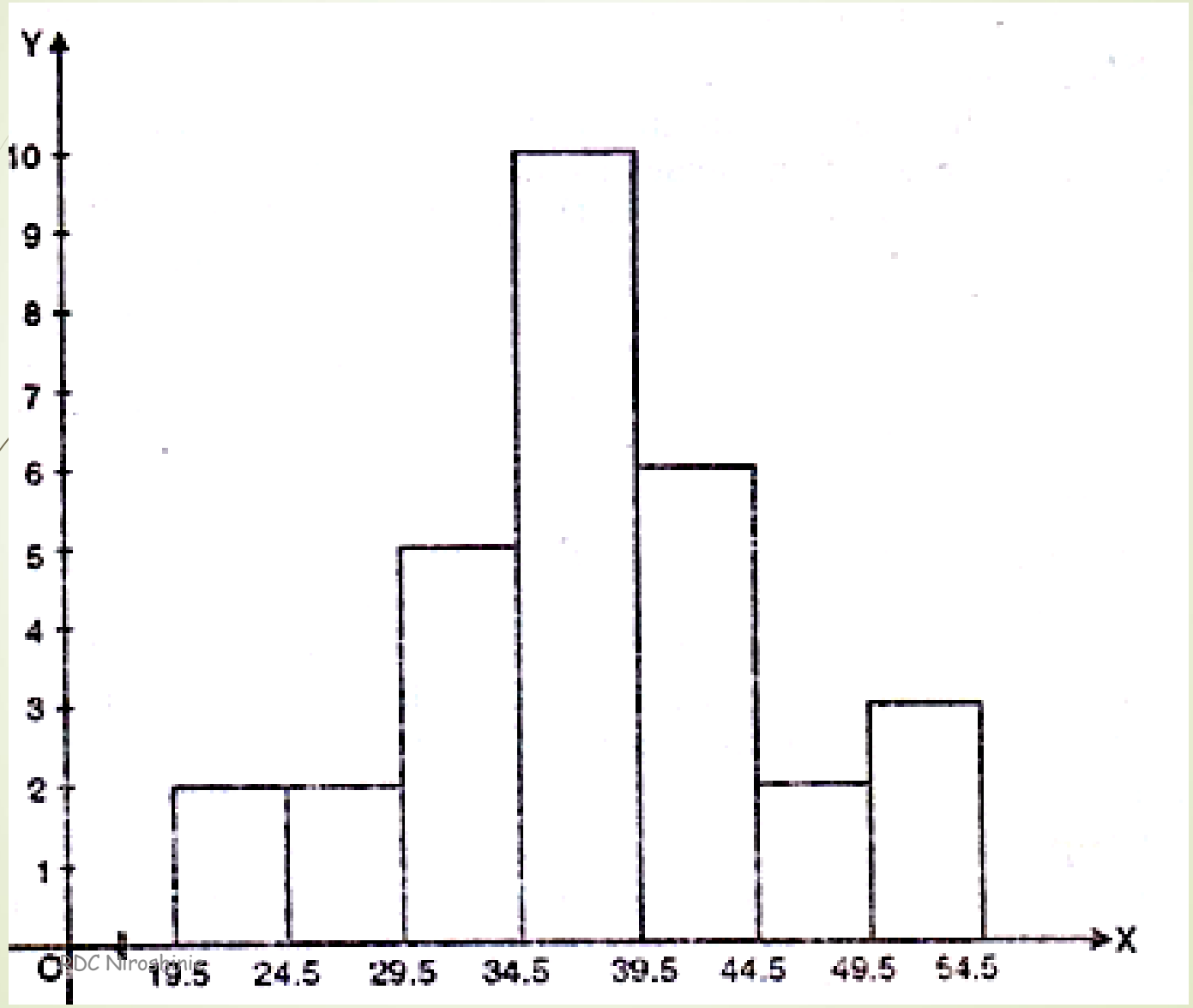

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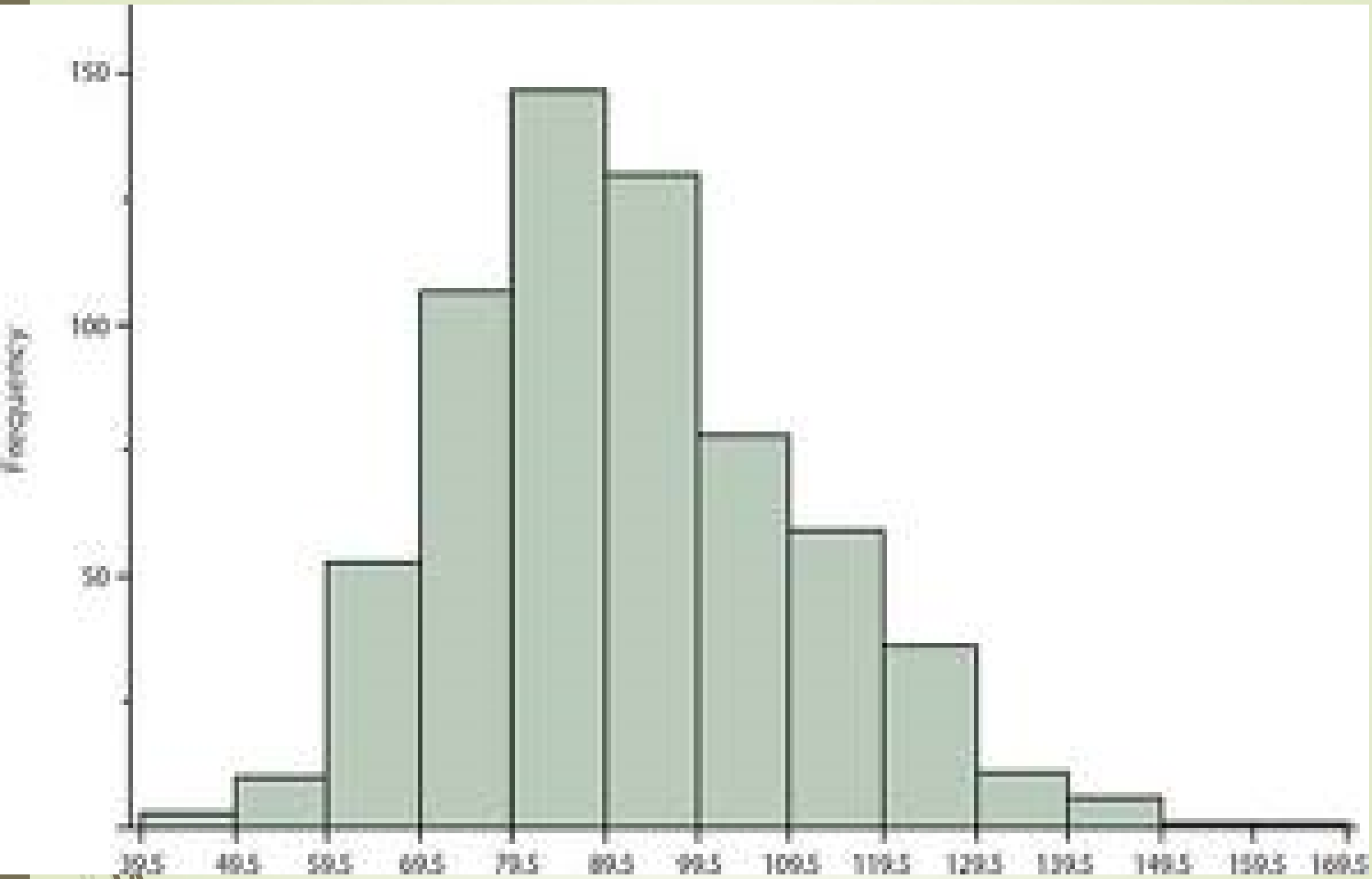
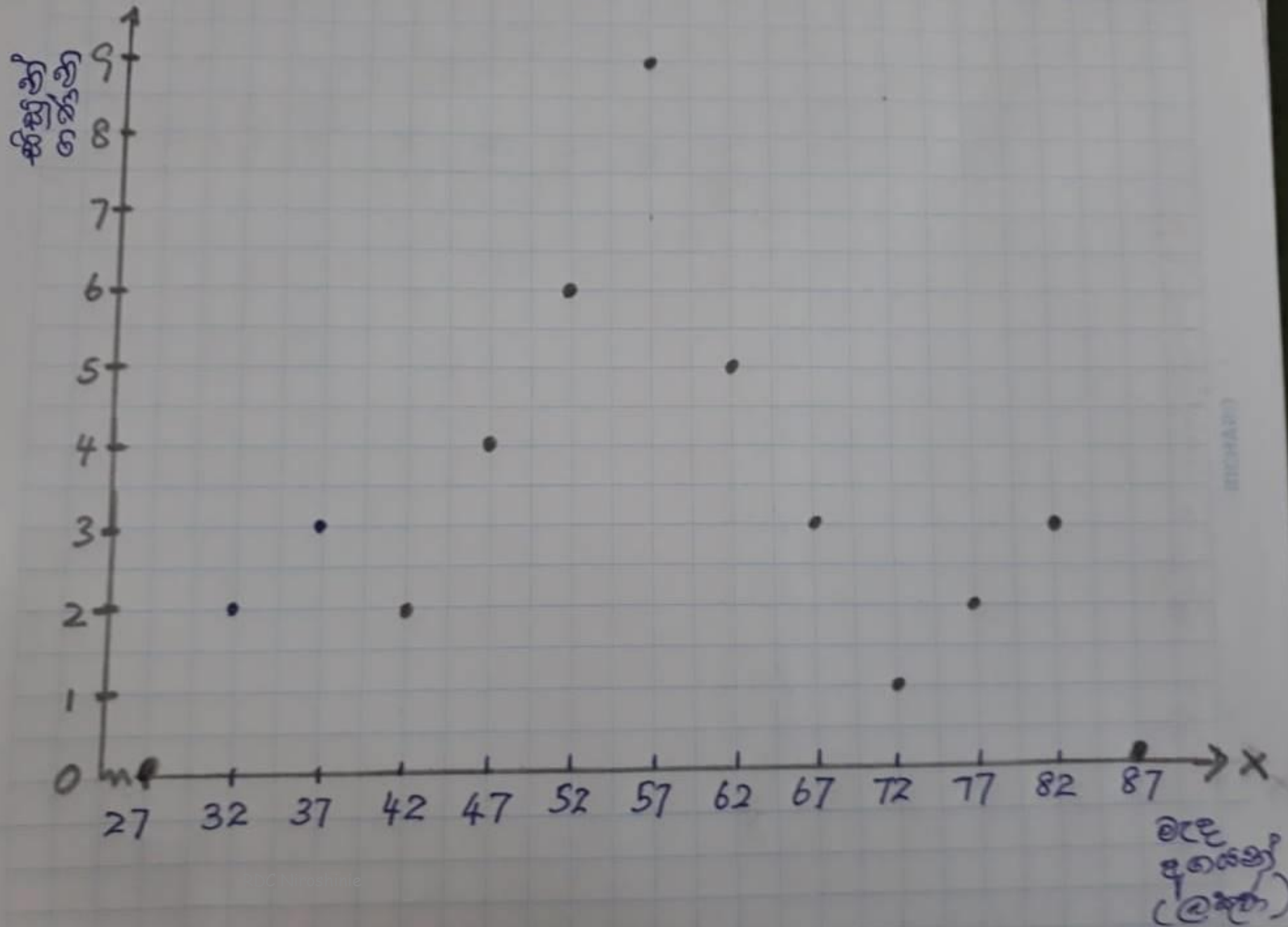

150
100
50
frequency
39.5
49.5
59.5
69.5
79.5
89.5
99.5
109.5
119.5
129.5
139.5
149.5
159.5
169.5

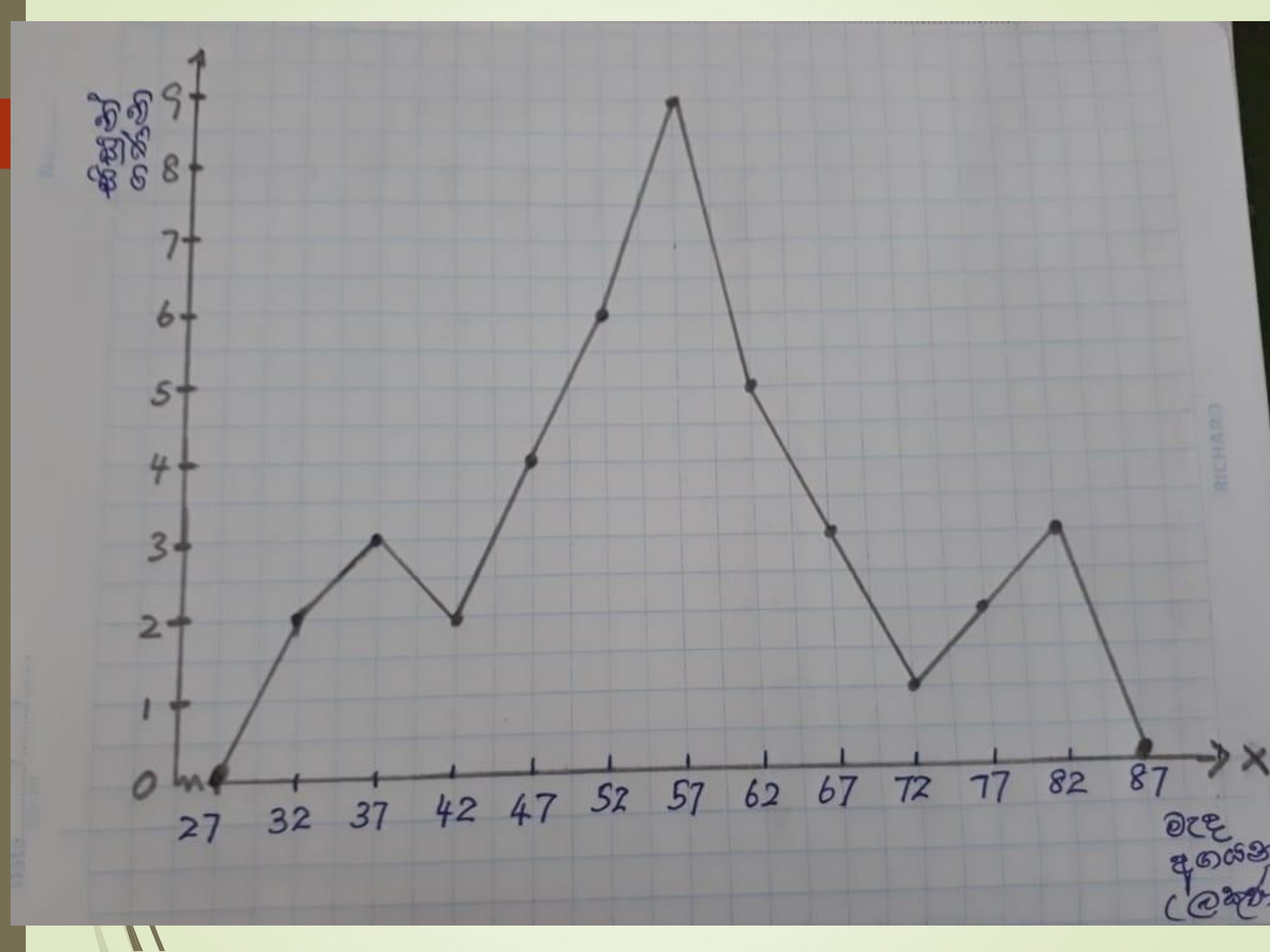
Frequency Polygon

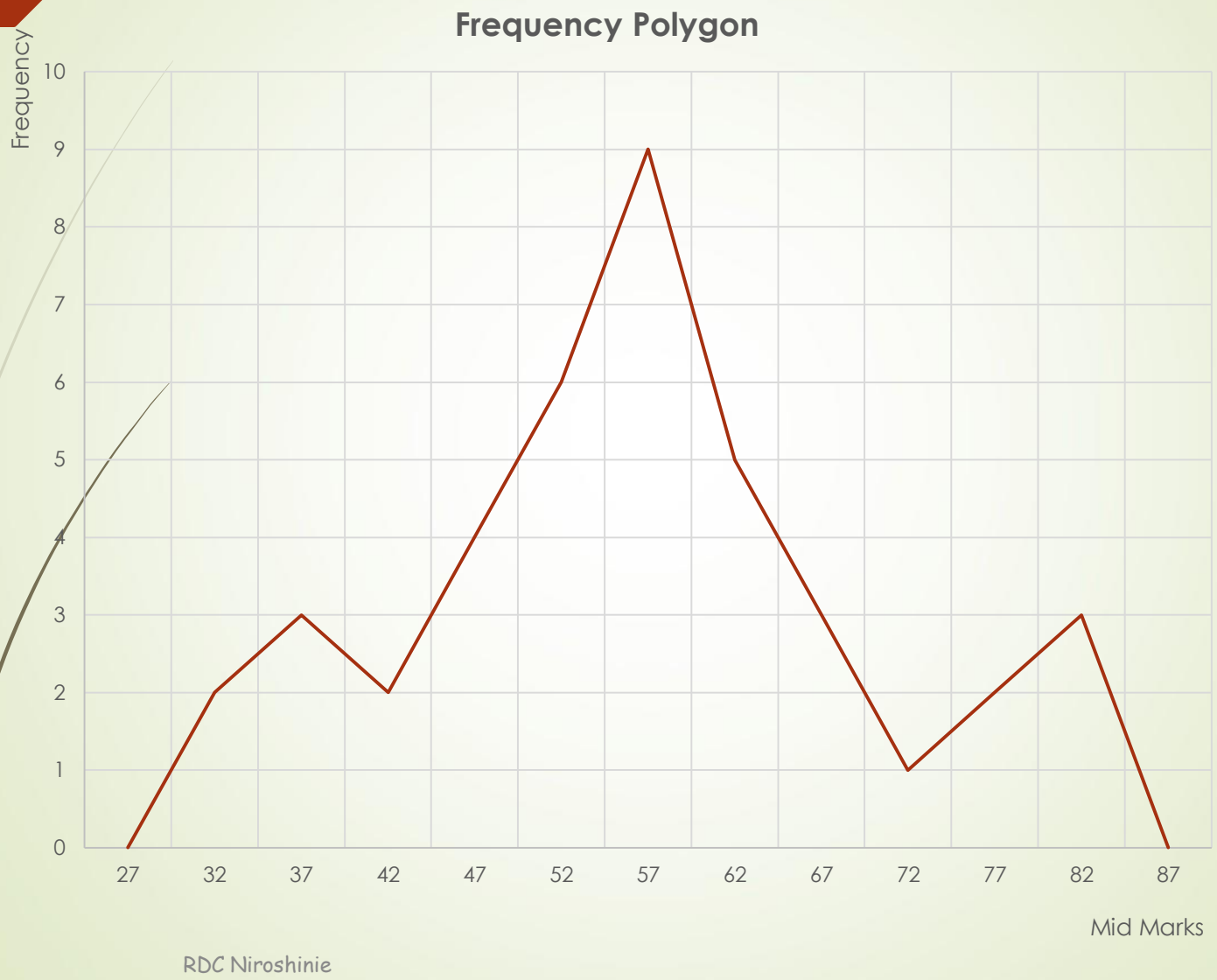
The frequency polygon is a frequency graph which is drawn by joining the coordinating points of the mid-values of the class intervals and their corresponding frequencies.

frequencies are plotted on the vertical axis beginning from zero

- **Mid points of classes are plotted on the horizontal axis.**
- **Midpoint of two extra classes, one below the given classes and one above the given classes are also plotted on the horizontal axis considering the frequency of those two classes to be zero.** Two additional points may be added to the two extreme end)
- **Respective points that represent the mid values of the classes (including the two extra classes) and their frequencies are then plotted on the graph.**
- **Then the points plotted are joined together by straight lines.**


සිසුන් ගණන
9
8
7
6
5
4
3
2
1
0
X
27
32
37
42
47
52
57
62
67
72
77
82
87
මැද අගයන් (බර)


0
1
2
3
4
5
6
7
8
9
27
32
37
42
47
52
57
62
67
72
77
82
87
X



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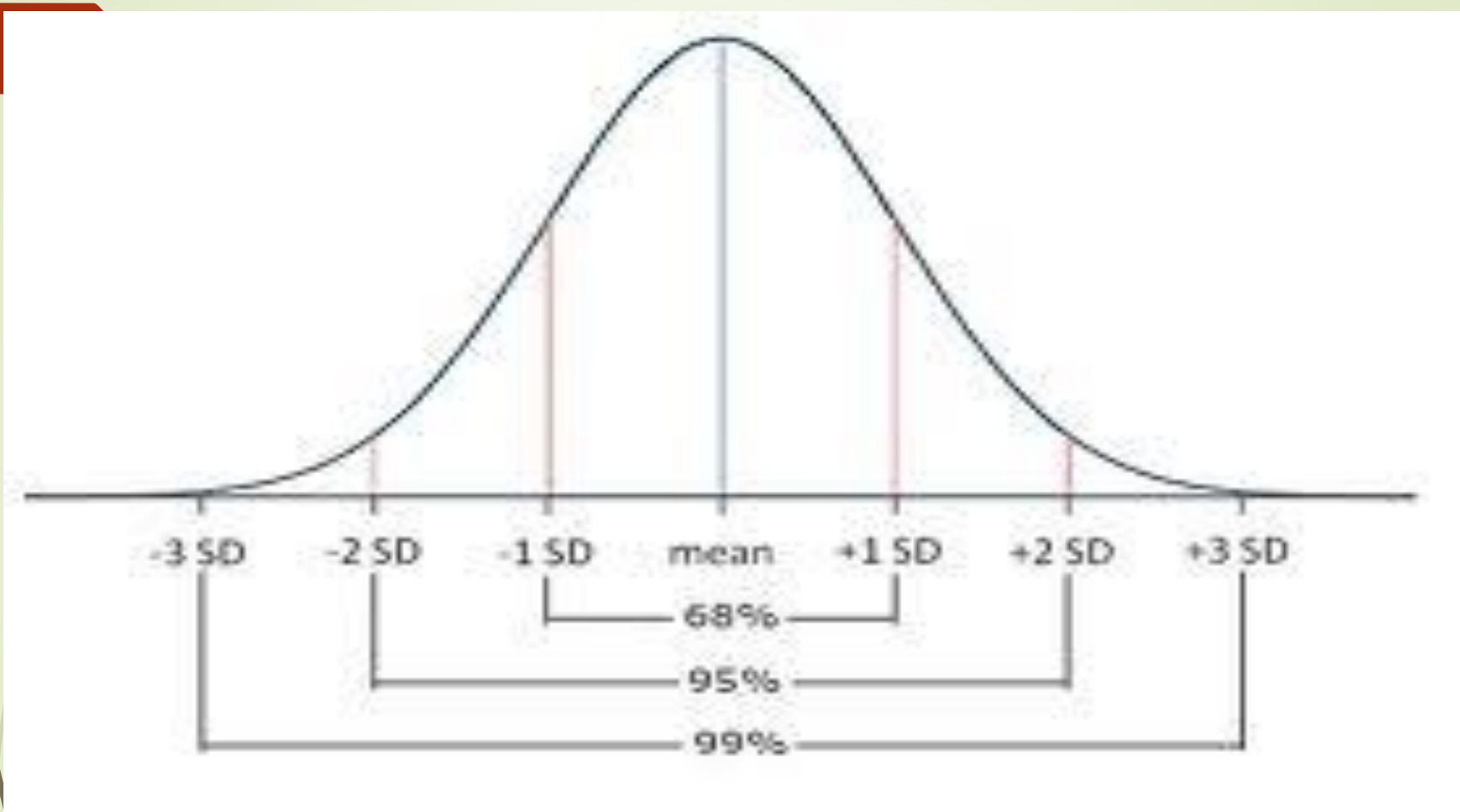
Interpretation of shapes in graphs

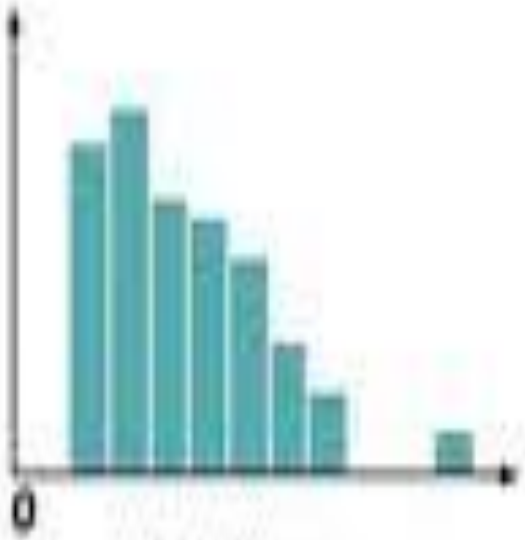
- Normal distribution
- skewed distribution

Normal Probability Curve (Normal Distribution)

- The normal distribution is symmetrically distributed on either side of its midpoint, which is the average value and also median and mode.
- If the distribution is symmetrical the part of the curve on the left side of the fold would be the mirror image of the part on the right side of the fold.
- The areas on either side of the peak are called tails.
- The area covered by the curve represents the total population.
- The base line is divided into six sigma distances from -3σ to $+3\sigma$.

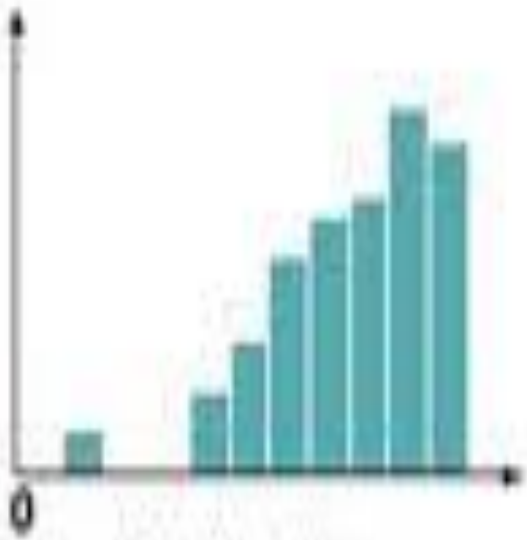

-3 SD
-2 SD
-1 SD
mean
+1 SD
+2 SD
+3 SD
68%
95%
99%

Analyzing Shape:



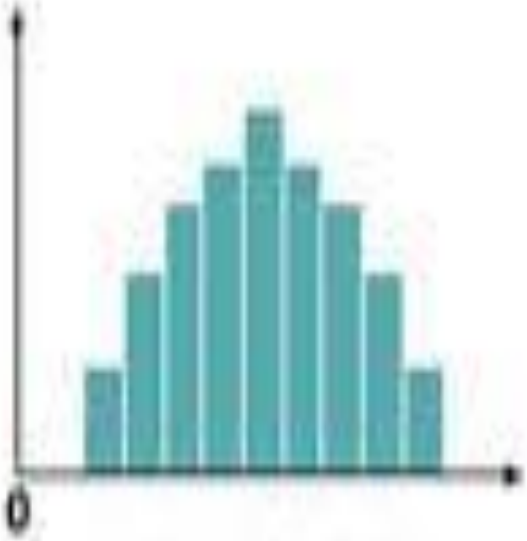
Positive Skew

Data is skewed to the right. The long tail of the data is on the right side of the peak.



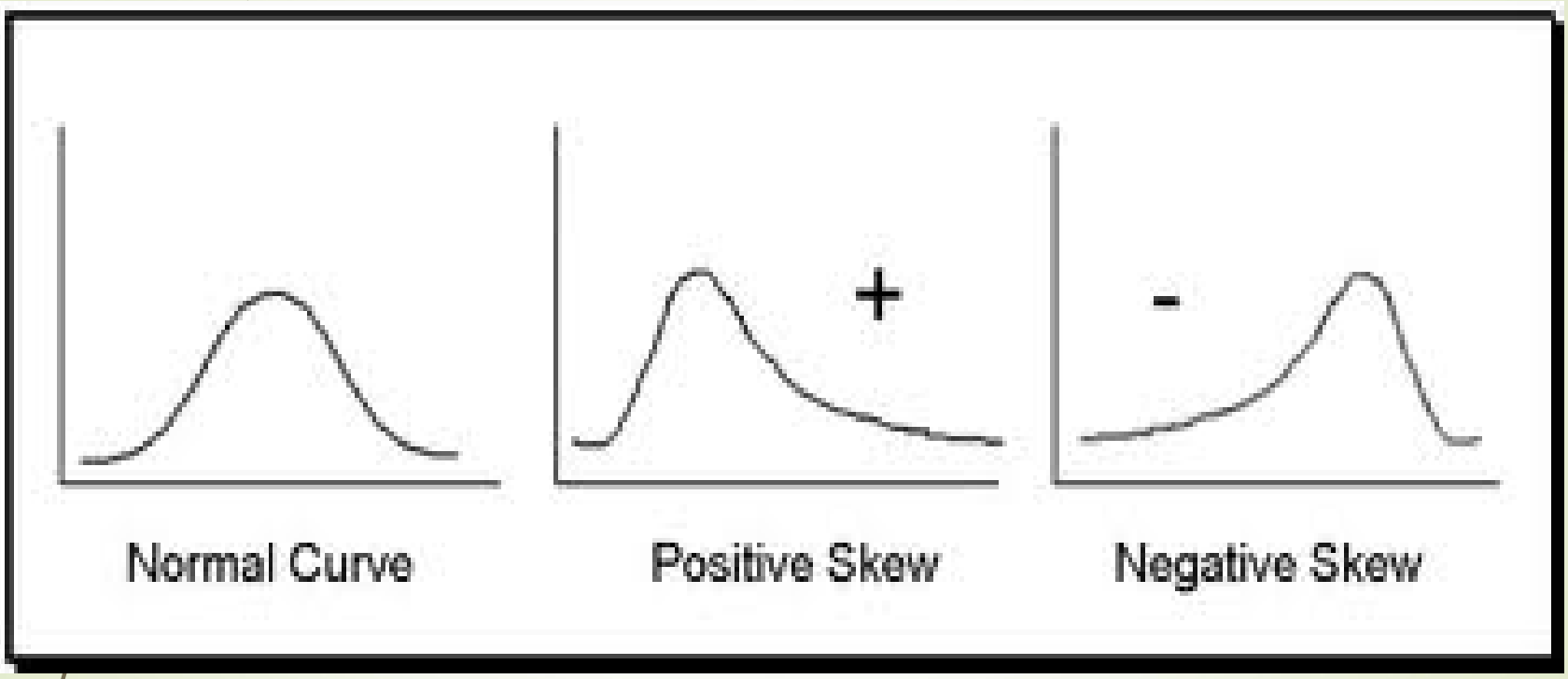
Negative Skew

Data is skewed to the left. The long tail of the data is on the left side of the peak.



Normal Distribution

Data is not skewed to the right or left. The data is evenly distributed on both sides of the peak.


+
-
Normal Curve
Positive Skew
Negative Skew

Cumulative frequency percentage curve- Ogive

CI	F	Mid value	Real limits	CF	CF%
80-84	3	82	79.5-84.5	40	100
75-79	2	77	74.5-79.5	37	92.5
70-74	1	72	69.5-74.5	35	87.5
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30-34	2	32	29.5-34.5	2	5

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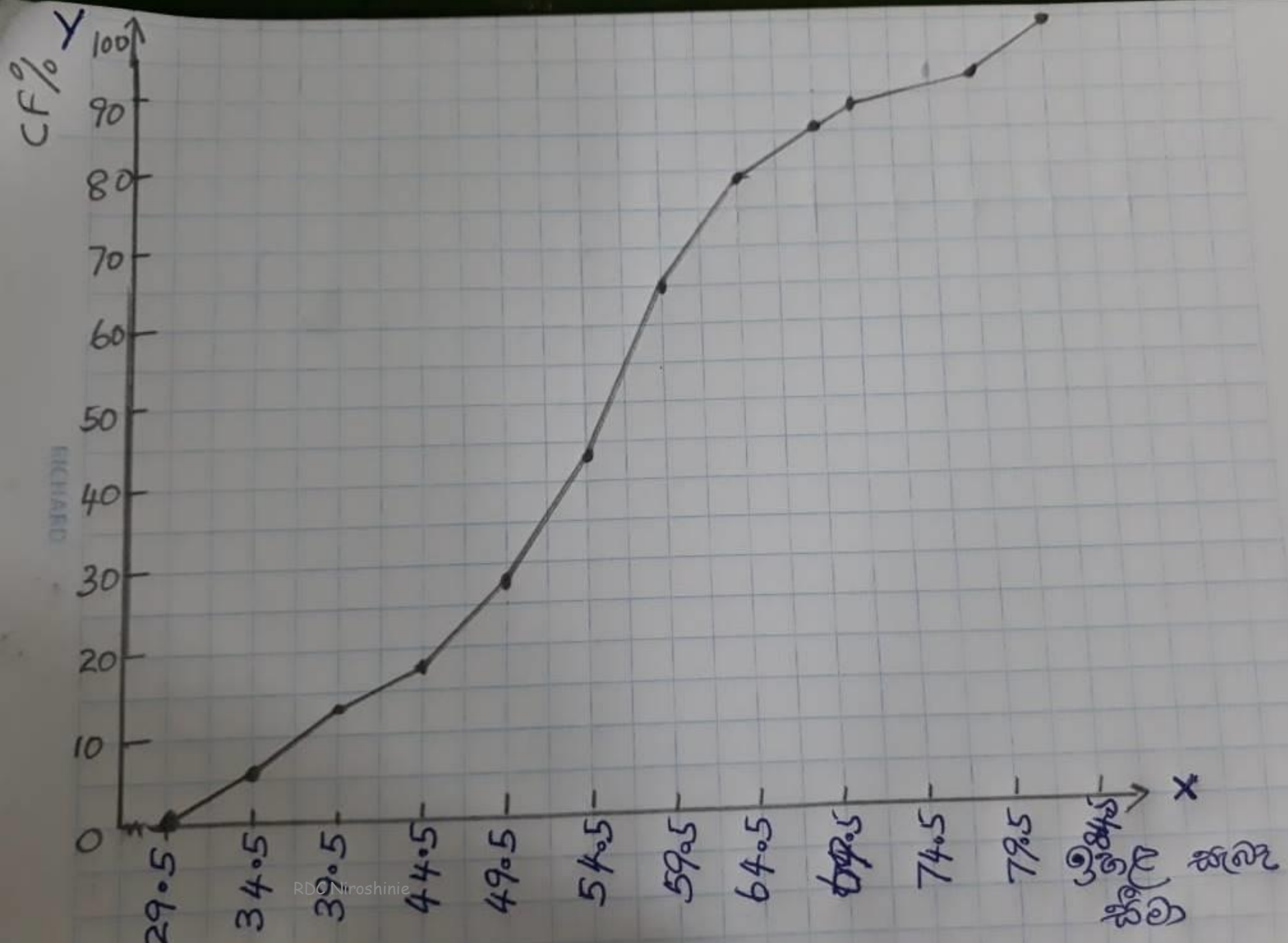
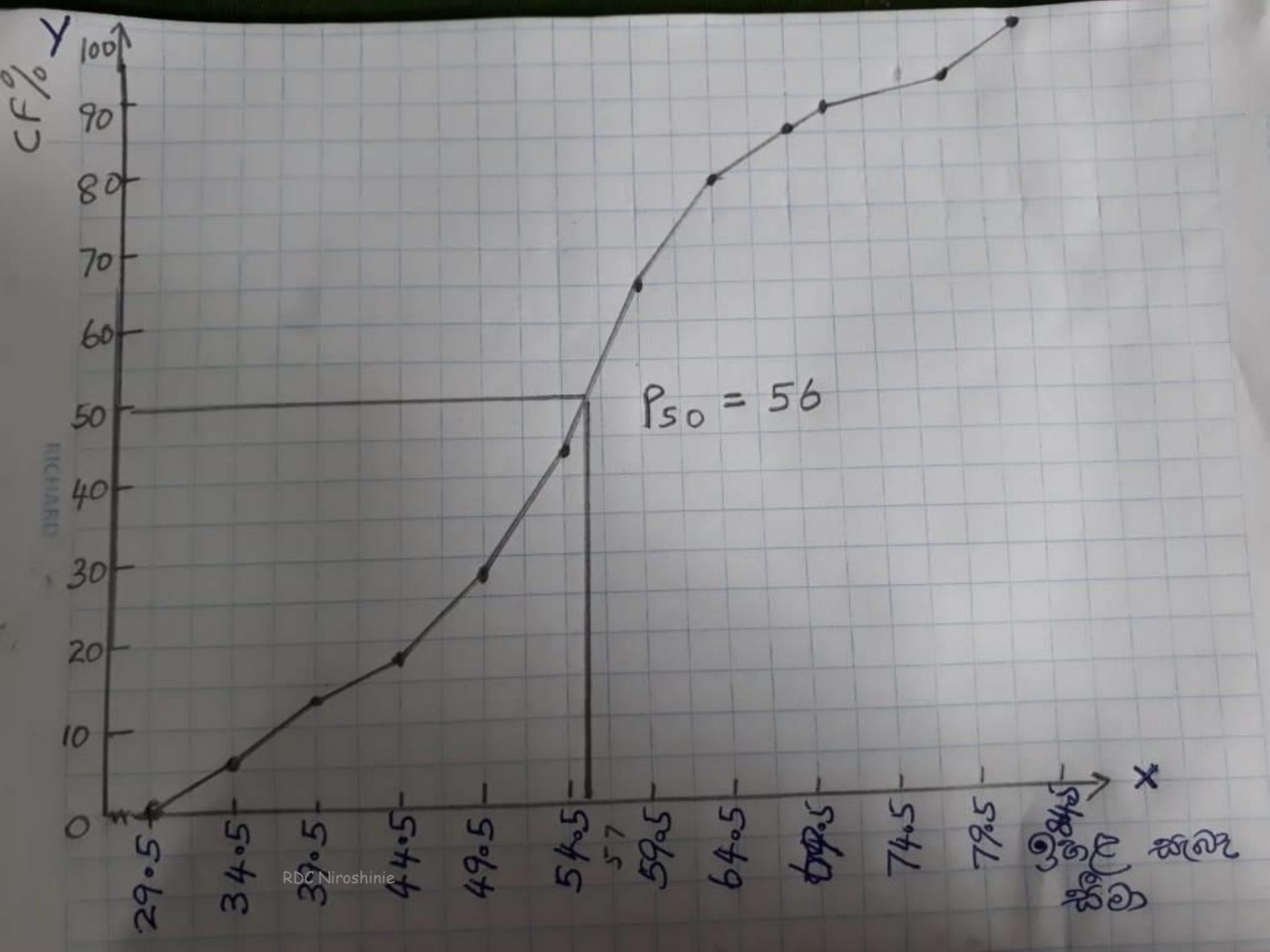

CF%
Y
100
90
80
70
60
50
40
30
20
10
0
X
29.5
34.5
39.5
44.5
49.5
54.5
59.5
64.5
74.5
79.5


CF% Y
100
90
80
70
60
50
40
30
20
10
0
$P_{50} = 56$
29.5
34.5
39.5
44.5
49.5
54.5
59.5
64.5
69.5
74.5
79.5
X
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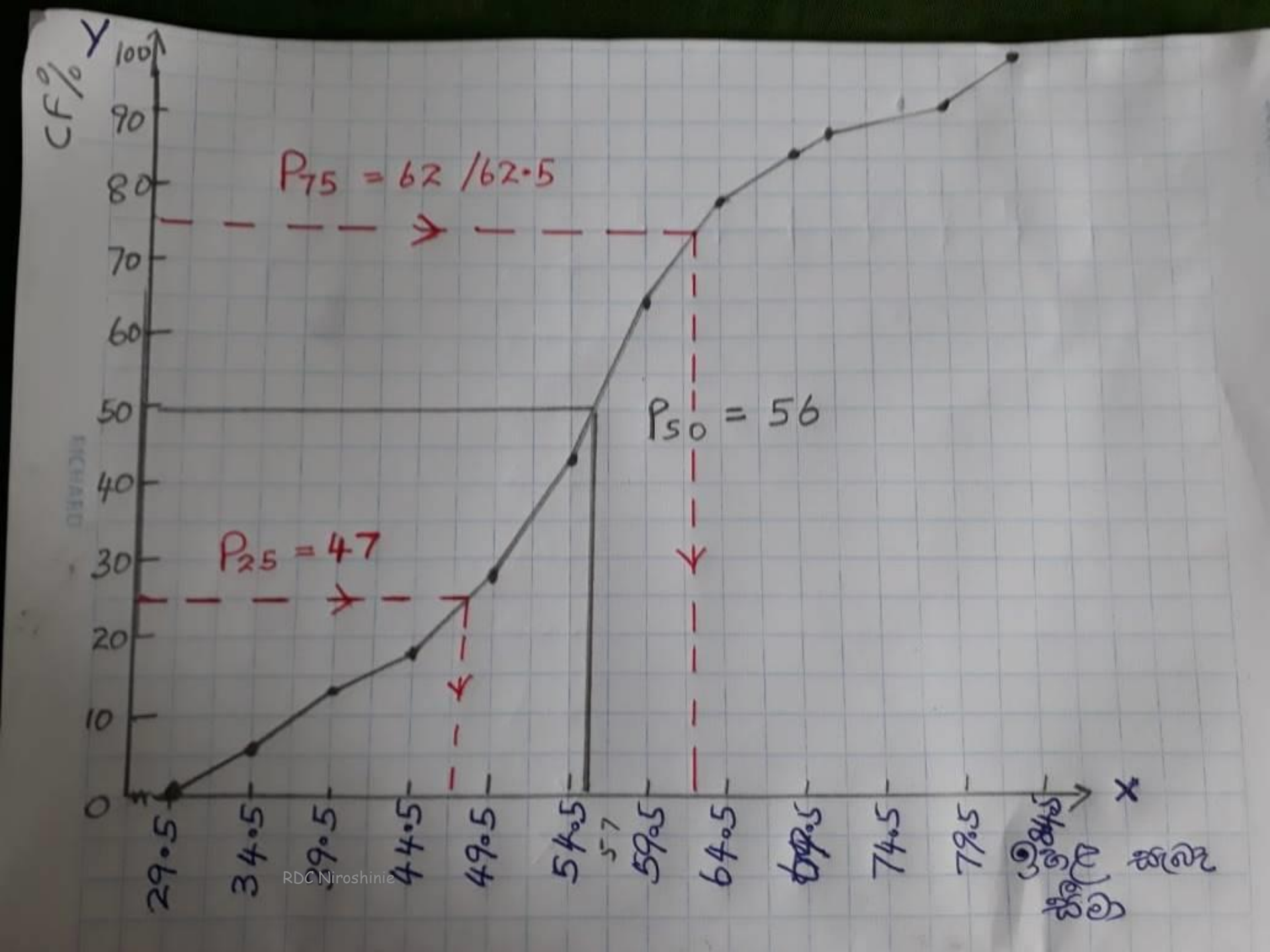
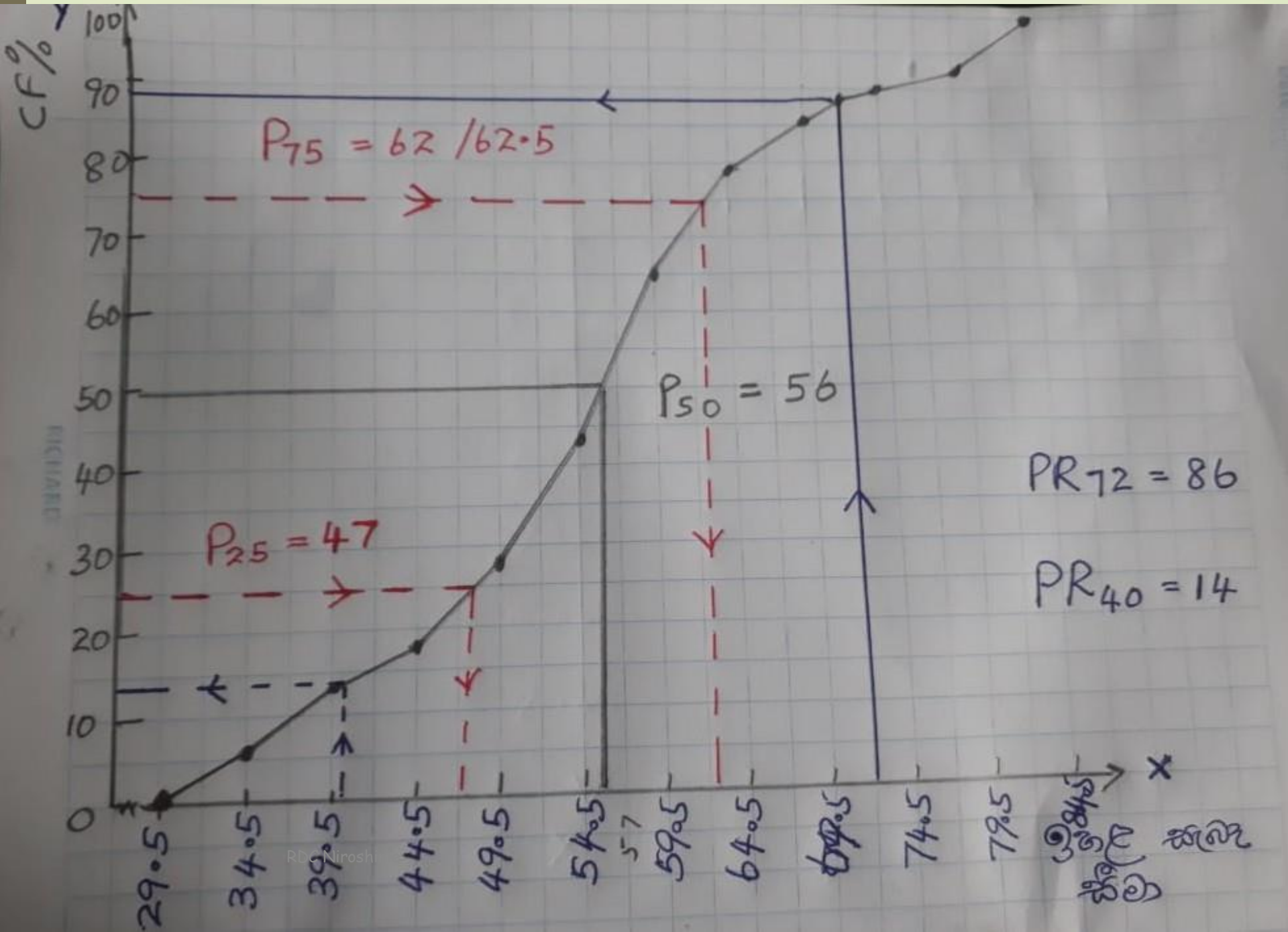
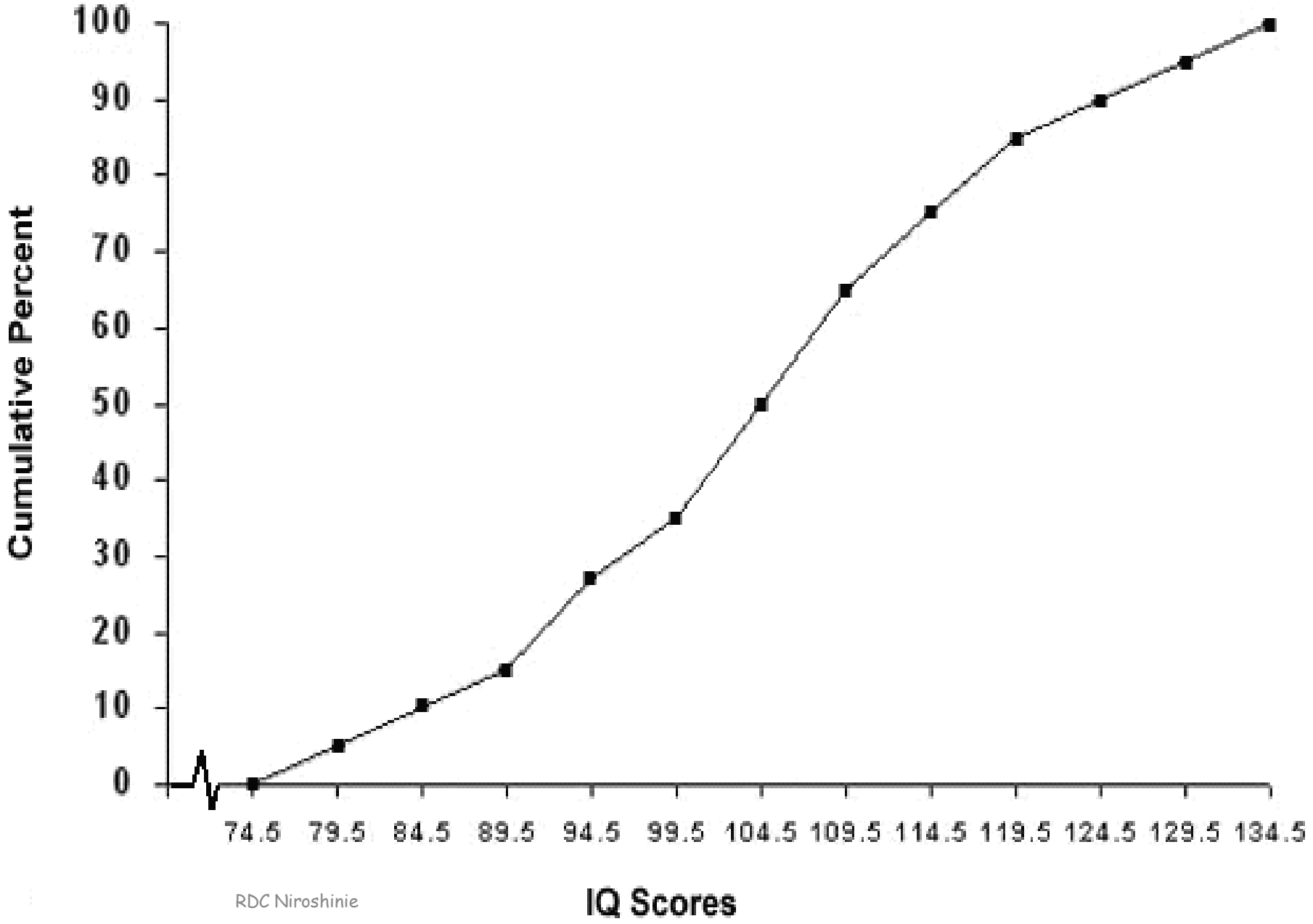

CF% Y
100
90
80
70
60
50
40
30
20
10
0
P_{75} = 62 /62·5
P_{50} = 56
P_{25} = 47
29·5
34·5
39·5
44·5
49·5
54·5
59·5
64·5
69·5
74·5
79·5
X


CF%
Y
100
90
80
70
60
50
40
30
20
10
0
P_{75} = 62 /62·5
P_{50} = 56
P_{25} = 47
PR_{72} = 86
PR_{40} = 14
29·5
34·5
39·5
44·5
49·5
54·5
59·5
64·5
69·5
74·5
79·5
X



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