

Statistics

Lecture 2



Feb 19-8:47 AM

How to make a freq. table and draw few graphs

SG 3
&
SG 4

- 1) Range = Max. - Min.
- 2) Class width = $\frac{\text{Range}}{\# \text{ of classes}}$
 - If decimal $\Rightarrow$ Round-up to a whole #
 - If whole $\Rightarrow$ Add 1

ex: A Sample has a min of 20 and max of 50.

Range = Max - Min = 50 - 20 = 30

Find class width if we wish to have

a) 3 classes

$$CW = \frac{\text{Range}}{3} = \frac{30}{3} = 10$$

$\uparrow$ whole #

CW = 11

b) 4 classes.

$$CW = \frac{\text{Range}}{4} = \frac{30}{4} = 7.5$$

$\uparrow$ decimal

CW = 8

Sep 8-10:37 AM

Freq. Table

class limits	class BNDRS	class MP	class F	Cum. F	Rel. F	%F

I randomly Selected 20 students and here are their ages.

18 19 19 20 23

1) Sample Size $n=20$

25 25 25 28 30

2) Min. = 18, Max = 52

32 32 32 35 37

38 40 45 50 52

3) Range = Max - Min

$$4) \text{Midrange} = \frac{\text{Max} + \text{Min}}{2} = \frac{52 + 18}{2} = \frac{70}{2} = 35$$

5) mode $\{25, 32\}$ Bimodal

6) find class width if we wish to have 3 classes.

$$CW = \frac{\text{Range}}{3} = \frac{34}{3} = 11.3$$

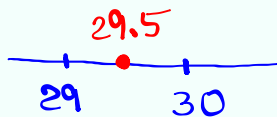
Decimal

↳ Round-up

$$CW = 12$$

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class limits	class BNDRS	class MP	class F	Cum. F	Rel. F	%F
18 - 29	17.5 - 29.5	23.5	9	9	.45	45%
30 - 41	29.5 - 41.5	35.5	8	17	.40	40%
42 - 53	41.5 - 53.5	47.5	3	20	.15	15%



$$\text{class MP} = \frac{\text{+class limits}}{2}$$

n=20

$$\text{Rel. F} = \frac{f}{n} = \frac{f}{20}$$

Here are Some graphs

Bar chart

Histogram

Ogive

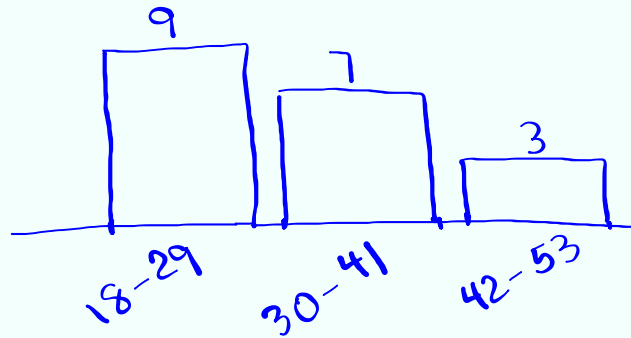
Freq. Polygon

Pie chart

Sep 8-10:53 AM

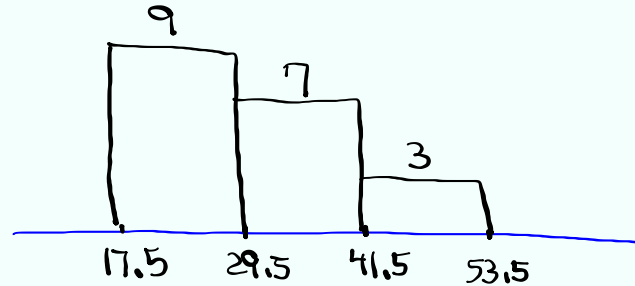
Bar chart

- class limits
- class F



Histogram

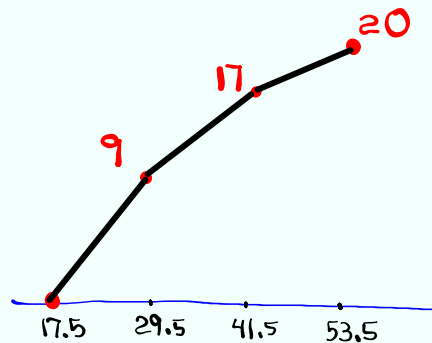
- class BNDRS
- class F



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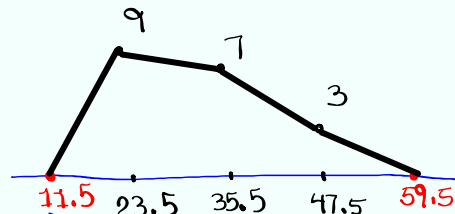
Ogive

- class BNDRS
- Cum. F
- start at 0 level
- Non-decreasing



Freq. Polygon

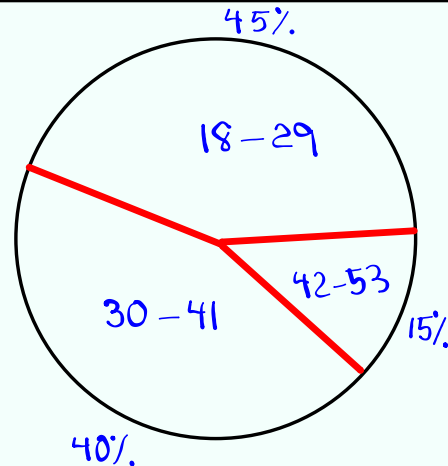
- class MP
- class F
- one additional MP on each side
- start & finish @ 0 level



Sep 8-11:12 AM

Pie Chart

- Circle
- class limits to name each slice
- % to scale each slice



How many of them were at least 30 yrs old? 11

what % of them were at least 30 yrs old? 55%

Sep 8-11:18 AM

I randomly selected 25 exams, here are the Scores:

52 58 60 63 68
70 72 75 78 78
78 80 82 85 85
85 85 89 90 92
95 97 99 100 100

1) $n = 25$

2) $\text{Min} = 52, \text{Max} = 100$

3) $\text{Range} = \text{Max} - \text{Min}$
 $= 100 - 52 = \boxed{48}$

4) $\text{Midrange} = \frac{\text{Max} + \text{Min}}{2}$
 $= \frac{100 + 52}{2} = \boxed{76}$

5) Mode $\boxed{85}$

6) Find class width if we wish to have 4 classes.

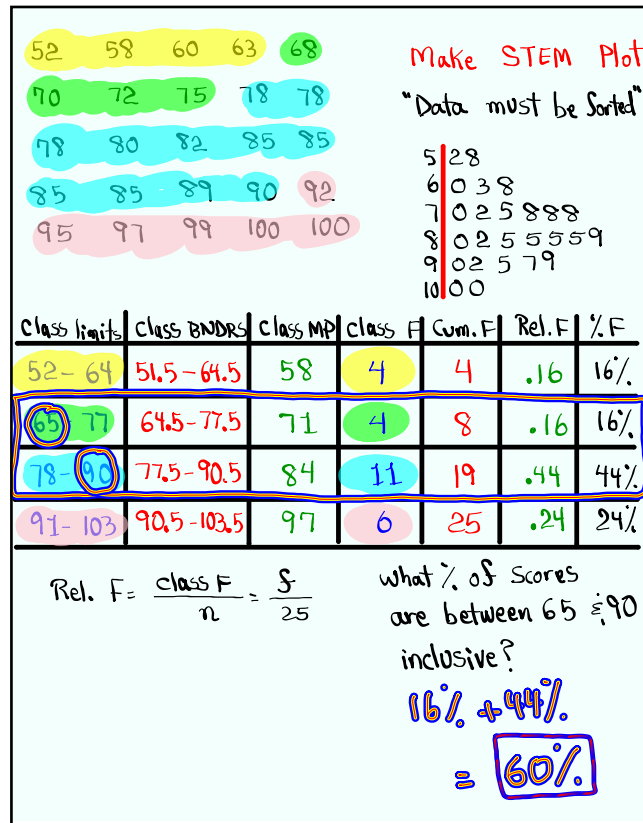
$\text{CW} = \frac{\text{Range}}{4} = \frac{48}{4} = 12$

whole #

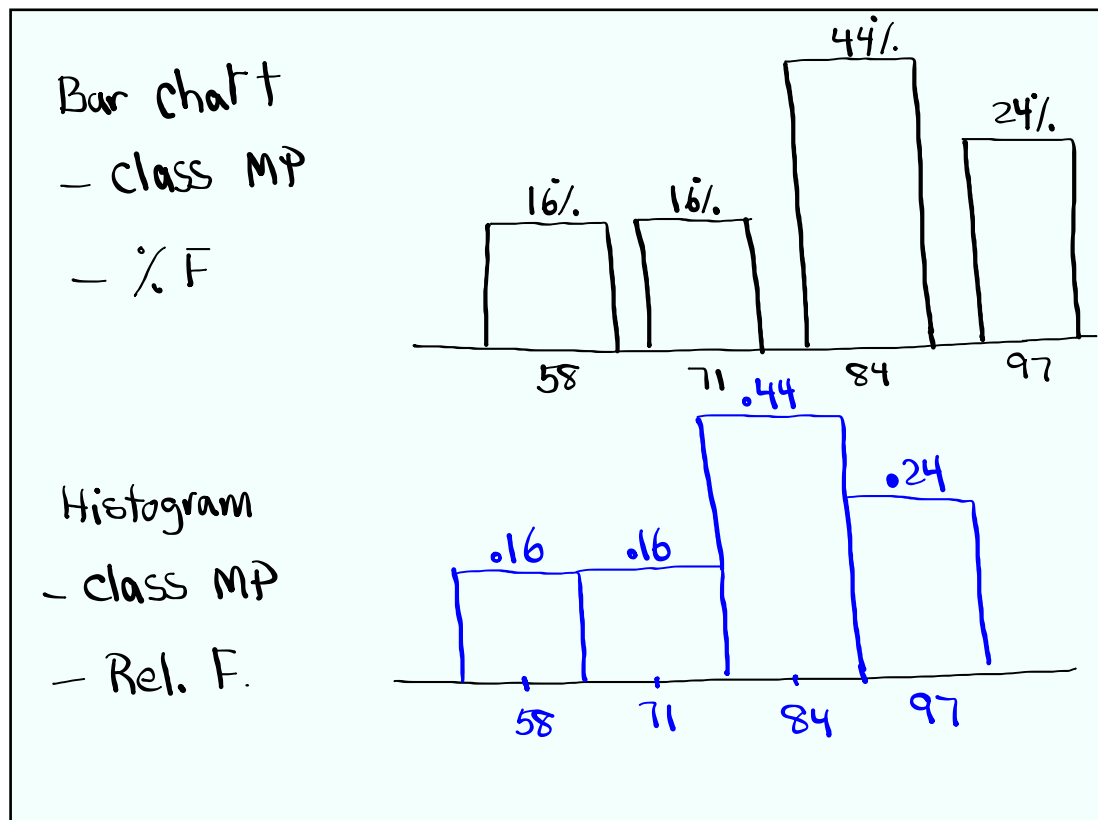
$\text{CW} = 12 + 1$

$\boxed{\text{CW} = 13}$

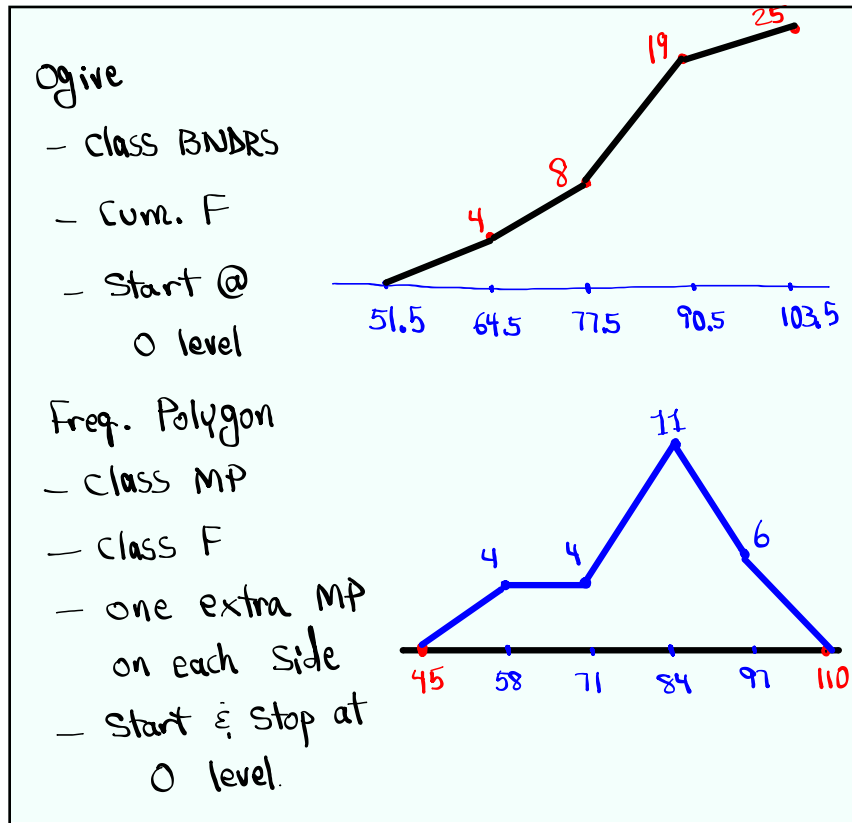
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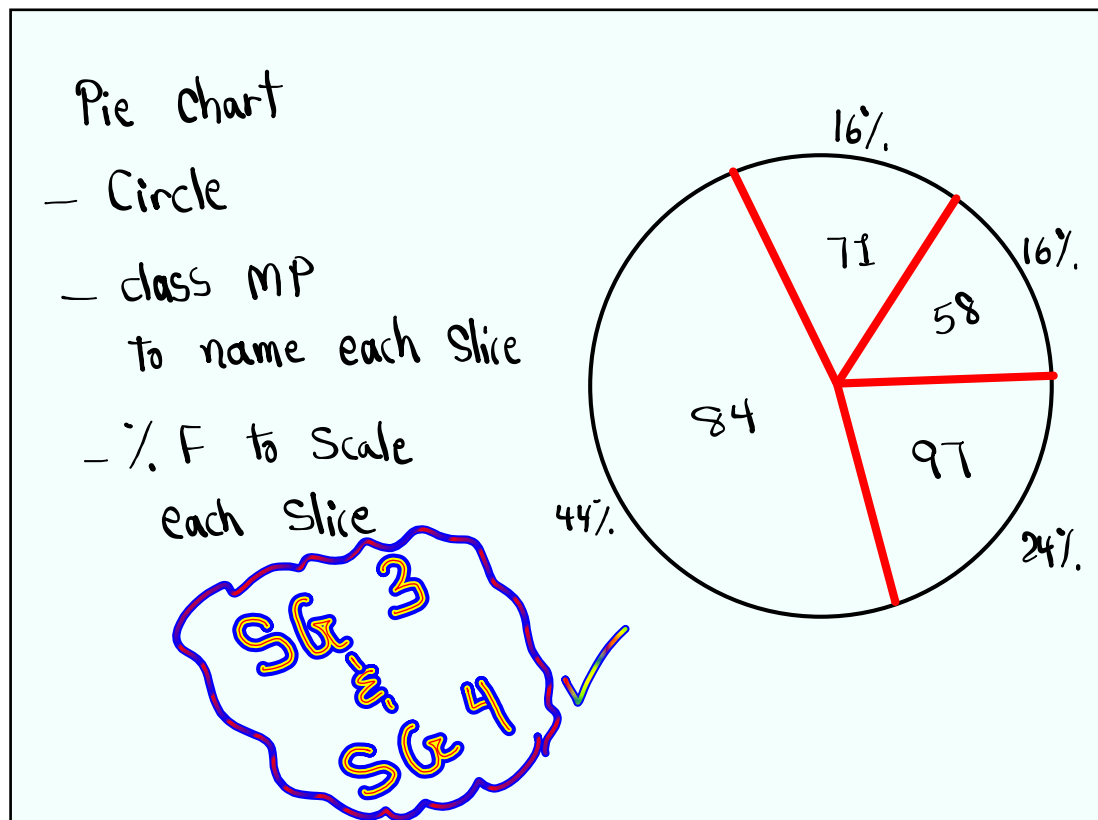
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Sep 8-11:55 AM



Sep 8-11:59 AM



Sep 8-12:04 PM

Consider the Sample below

2 3 3 4 8

1) $n = 5$ 2) Range = $8 - 2 = 6$

3) Midrange = $\frac{8+2}{2} = 5$ 4) Mode 3

5) $\sum x = 2 + 3 + 3 + 4 + 8 = 20$
↑ Summation
↑ data element

6) $\sum x^2 = 2^2 + 3^2 + 3^2 + 4^2 + 8^2$
 $= 4 + 9 + 9 + 16 + 64 = 102$

7) $\frac{\sum x}{n} = \frac{20}{5} = 4$

8) $\frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{5 \cdot 102 - 20^2}{5(5-1)} = \frac{110}{20}$
 $= \frac{11}{2} = 5.5$

9) $\sqrt{\text{last answer}} = \sqrt{5.5} \approx 2.345$

whole #	2
1-dec.	2.3
2-dec.	2.35

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Consider the Sample below

2 2 4 4 6 6 8 8

1) $n = 8$ 2) Range = $8 - 2 = 6$

3) Midrange = $\frac{8+2}{2} = 5$ 4) Mode None

5) $\sum x = 2 + 2 + 4 + 4 + 6 + 6 + 8 + 8 = 40$

6) $\sum x^2 = 2^2 + 2^2 + 4^2 + 4^2 + 6^2 + 6^2 + 8^2 + 8^2 = 240$

7) $\frac{\sum x}{n} = \frac{40}{8} = 5$

8) $\frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{8 \cdot 240 - 40^2}{8(8-1)} = \frac{320}{56}$
 ≈ 5.714

9) $\sqrt{\text{Last Answer}} = \sqrt{5.714} \approx 2.390$

whole #	2	2-dec.
1-dec.	2.4	2.39

Sep 8-12:20 PM