

**Statistics
Lecture 8**



Feb 19-8:47 AM

Class QZ 7

Use the chart below

class MP	class F
15	2
25	8
35	10
45	5

class MP → L1
 class F → L2

Find
 1) $\bar{x} = 32.2 = 32$ } Round to whole #
 2) $S = 8.907 = 9$
 3) $n = 25$
 4) $S^2 = \frac{238}{3}$ } Reduced fraction

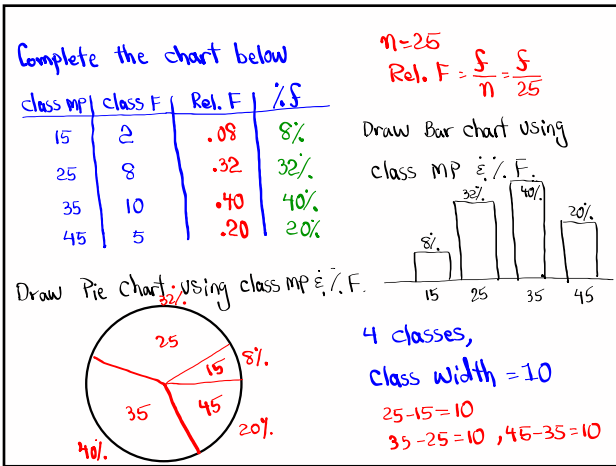
with Menu
 List: L1
 freq. List: L2
 [Calculate]
 NO Menu
 1-Var stats
 L1, L2 Enter

Clear all lists.
 [end] [2nd] [4: Clear All Lists] Enter
 Reset all lists.
 [STAT] [Edit] Enter
 [5: SetupEditor]

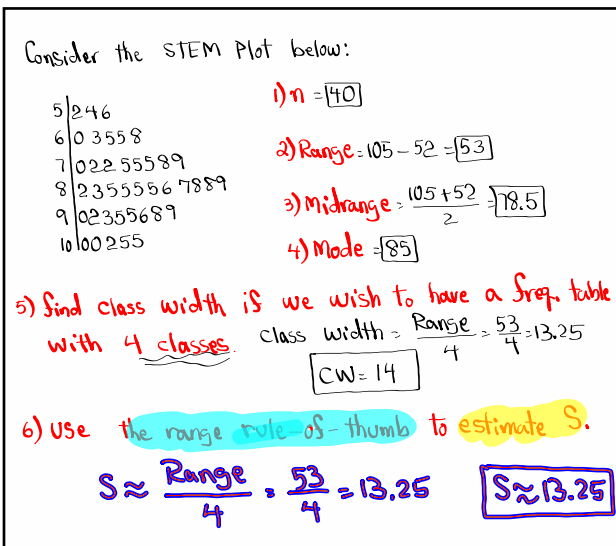
[2nd] [4]
 [2nd] [9]

[VARS] [5: Statistics]
 [3: Sx] [x²] [MATH]
 [1: ▸ Frac] Enter

Nov 1-9:37 AM



Nov 2-7:29 AM



Nov 2-7:36 AM

Store this data in L1

Use **1-Var Stats** with **L1 only** to find

$\bar{x} = 82.3$
 $S = 14.465$
 $n = 40$

$S^2 = \frac{40802}{195}$

Find S^2 in reduced fraction
VARS **5: Statistics** **3: Sx**
 χ^2 **MATH** **1: \rightarrow Snc** **Enter**

↓ $Min = 52$
 ↓ $Q_1 = 72$
 ↓ $Med = 85$
 ↓ $Q_3 = 94$
 $Max = 105$

Nov 2-7:46 AM

5-Number Summary

1) Box Plot

2) $IQR = Q_3 - Q_1 = 22$

3) Upper Fence
 $= Q_3 + 1.5(IQR) = 94 + 1.5(22) = 127$

4) Lower Fence
 $= Q_1 - 1.5(IQR) = 72 - 1.5(22) = 39$

5) Discuss outliers:
None

Nov 2-7:59 AM

5 | 246
 6 | 03558
 7 | 02255589
 8 | 23555567889
 9 | 02355689
 10 | 00255

$n=40$

Find P_{20}

$L = \frac{20}{100} \cdot 40 = 8$

$P_{20} = \frac{8\text{th element} + \text{Next one}}{2}$

$= \frac{68 + 70}{2} = \boxed{69}$

20% | 80%

$P_{20} = 69$

Find P_{85}

$L = \frac{85}{100} \cdot 40 = 34$

$P_{85} = \frac{34\text{th element} + \text{Next one}}{2}$

$= \frac{98 + 99}{2} = \boxed{98.5}$

85% | 15%

$P_{85} = 98.5$

Find P_{32}

$L = \frac{32}{100} \cdot 40 = 12.8 \rightarrow L = 13$

$P_{32} = 13\text{th element} = \boxed{75}$

32% | 68%

$P_{32} = 75$

Nov 2-8:06 AM

5 | 246
 6 | 03558
 7 | 02255589
 8 | 23555567889
 9 | 02355689
 10 | 00255

Find k such that $P_k = 70$

what is Percentile ranking of 70?

$k = \frac{B}{n} \cdot 100 = \frac{8}{40} \cdot 100 = 20$

$P_{20} = 70$

20% | 80%

$P_{20} = 70$

Find k such that $P_k = 100$

Percentile ranking of 100

$k = \frac{B}{n} \cdot 100 = \frac{35}{40} \cdot 100 = 87.5 \approx 88$

88% | 12%

$P_{88} = 100$

$P_{88} = 100$

SG 5-8 ✓

Nov 2-8:13 AM

Consider the following ordered Pairs: SG 9
 (x, y)
 $(0, 3), (2, 5), (3, 6), (3, 8), (4, 8)$

x	y	x ²	y ²	xy
0	3	0	9	0
2	5	4	25	10
3	6	9	36	18
3	8	9	64	24
4	8	16	64	32

$n=5$ ✓
 $\sum x = 12$ ✓
 $\sum x^2 = 38$ ✓
 $\sum y = 30$ ✓
 $\sum y^2 = 198$ ✓
 $\sum xy = 84$ ✓

Clear all lists
 $x \rightarrow L1, y \rightarrow L2$
 [STAT] → [CALC] → [2-Var Stats]

With Menu } NO Menu }
 xlist: L1 } 2-Var Stats }
 Ylist: L2 } L1, L2 [Enter] }
 Freq List: [Clear] } [] }
 [Calculate] }

Nov 2-8:46 AM

Consider the chart below

x	y	x ²	y ²	xy
✓ 1	5	1	25	5
✓✓ 2	8	4	64	16
✓✓✓ 4	10	16	100	40
✓✓✓✓ 5	12	25	144	60

i) Complete the chart
 2) $n=4$ ✓
 3) $\sum x = 12$ ✓
 $\sum x^2 = 46$ ✓
 $\sum y = 35$ ✓
 $\sum y^2 = 333$ ✓
 $\sum xy = 121$ ✓

Clear all lists
 $x \rightarrow L1, y \rightarrow L2$
 use [2-Var Stats] with [L1] & [L2]
 to verify

Draw Scatter Plot & possible Regression line
 $y = a + bx$

Nov 2-9:02 AM

How to find $y = a + bx$

1) Using Formula

$$a = \frac{\sum y \cdot \sum x^2 - \sum x \cdot \sum xy}{n \sum x^2 - (\sum x)^2}$$

$$a = \frac{35 \cdot 46 - 12 \cdot 121}{4 \cdot 46 - 12^2} = \frac{158}{40} = 3.95$$

$$b = \frac{n \cdot \sum xy - \sum x \cdot \sum y}{n \sum x^2 - (\sum x)^2}$$

$$b = \frac{4 \cdot 121 - 12 \cdot 35}{4 \cdot 46 - 12^2} = \frac{64}{40} = 1.6$$

$n = 4$
 $\sum x = 12$
 $\sum x^2 = 46$
 $\sum y = 35$
 $\sum y^2 = 333$
 $\sum xy = 121$

$y = 3.95 + 1.6x$

Nov 2-9:13 AM

2) using TI

$x \rightarrow L1, y \rightarrow L2$

STAT → CALC

8: Lin Reg (a+bx)

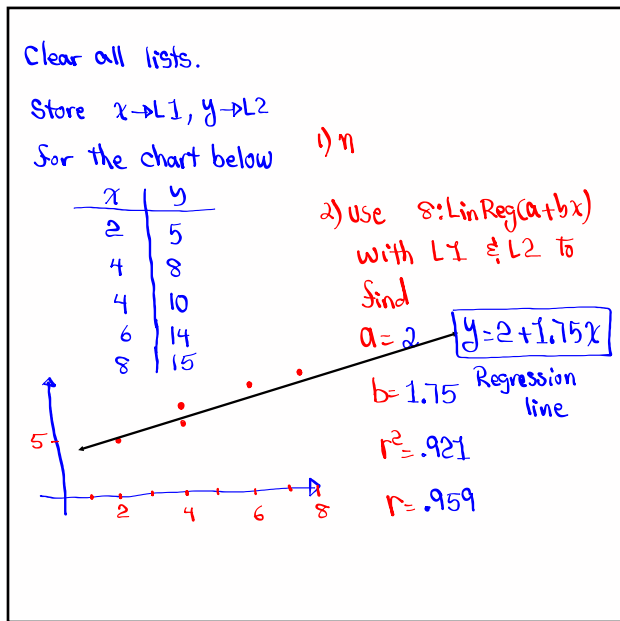
With Menu
 x list: L1
 y list: L2
 clear
 Calculate

No Menu
 Lin Reg (a+bx)
 L1, L2 [Enter]
 []

$y = a + bx$
 $a = 3.95$
 $b = 1.6$
 $r^2 = .957$
 $r = .978$

When r & r^2 are missing:
 [2nd] [0] [↓] ... [↓] Diagnostic On
 [Enter] [Enter]

Nov 2-9:22 AM



Nov 2-9:32 AM