Gerardo J. Alves Junior

Exercício 7)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
0	3	3	15	15	0	10,83
1	6	9	30	45	6	4,86
2	5	14	25	70	10	0,05
3	2	16	10	80	6	2,42
4	4	20	20	100	16	17,64
	$\Sigma = 20$		$\Sigma = 100$		$\Sigma = 38$	$\Sigma = 35,8$

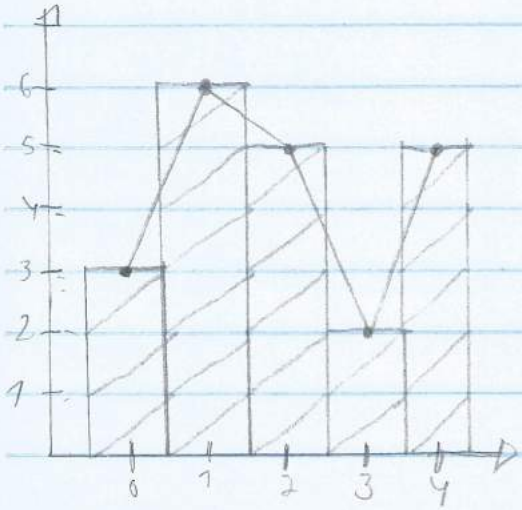
$$\bar{x} = \frac{\Sigma(x_i \cdot f_i)}{n} = \frac{38}{20} = 1,9$$

$Md = (2+2)/2 = 2$

Moda = 1

$$\text{Variância} = s^2 = \frac{\Sigma((x_i - \bar{x}) \cdot f_i)}{n-1} = \frac{35,8}{19} = 1,88$$

$$\text{desvio padrão} = \sqrt{s^2} = \sqrt{1,88} = 1,37$$



Exercício 2)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
160	20	20	25	25	3200	55,71
161	17	37	21,25	46,25	2737	7,41
162	19	56	23,75	70,00	3078	2,20
163	18	74	22,50	92,5	2934	32,32
164	06	80	7,50	100,00	984	32,85
	$\Sigma = 80$		$\Sigma = 100$		12933	$\Sigma = 129,89$

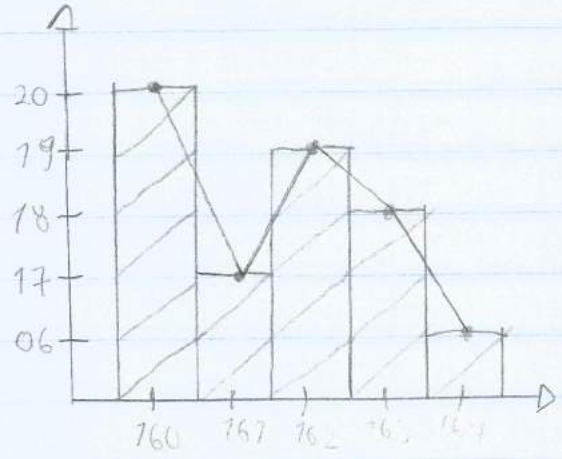
$$\bar{x} = \frac{12\,933}{80} = 161,66$$

$Md = 162$

$Moda = 160$

$$Var = S_x^2 = \frac{129,89}{79} = 1,64$$

$$\text{desvio padrão} = \sqrt{S_x} = \sqrt{1,64} = 1,28$$



Exercício 3)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
0	3	3	6	6	0	361,60
1	3	6	6	12	3	229,16
2	3	9	6	18	6	179,72
3	2	11	4	22	6	90,86
4	3	14	6	28	12	98,84
5	2	16	4	32	10	41,94
6	2	18	4	36	12	27,98
7	1	19	2	38	7	7,51
8	2	21	4	42	16	6,06
10	1	22	2	44	10	0,67
11	6	28	12	56	66	9,53
12	6	34	12	68	72	30,65
13	2	36	4	72	26	27,26
14	3	39	6	78	42	54,44
15	1	40	2	80	15	27,67
16	1	41	2	82	16	30,19
17	3	44	6	88	51	158,12
19	3	47	6	94	57	251,21
20	3	50	6	100	60	325,80
	$\sum = 50$		$\sum = 100$		$\sum = 487$	$\sum = 1983,64$

$\bar{x} = \frac{487}{50} = 9,74$

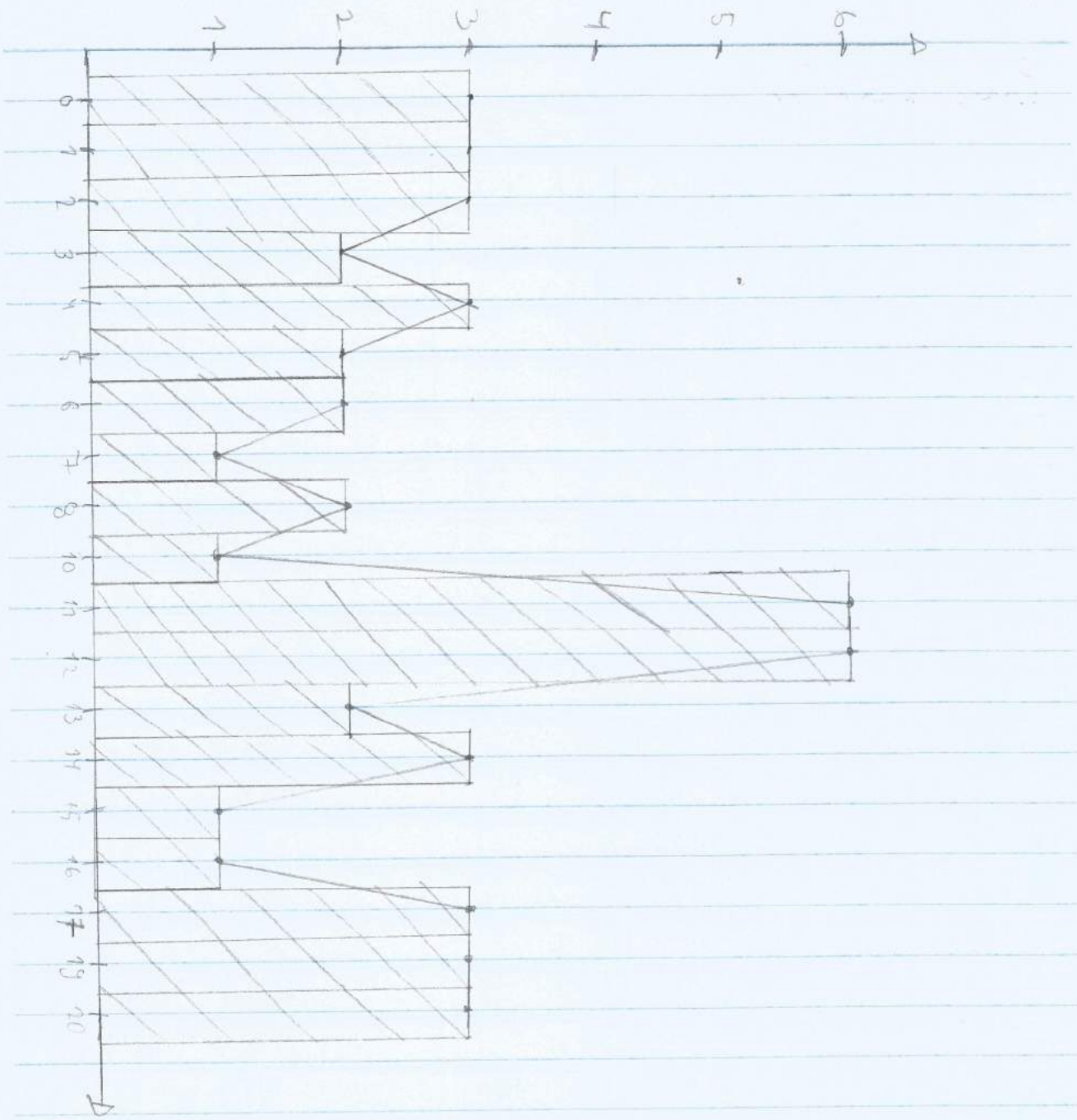
des. padrão = $\sqrt{S_x}$

des. padrão = 6,2

Mod = 11

Média = 11,72...

Var = $S_x^2 = \frac{1983,64}{49} - 38,44$


1
2
3
4
5
6
A
A

Exercício 4)

x_i	f_i	F_i	f_n (%)	F_n (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
50	3	3	5	5	150	109, 87
51	7	10	11,67	16,67	357	178, 52
52	3	13	5	21,67	156	49, 27
53	2	15	3,33	25	106	18, 61
54	3	18	5	30	162	12, 61
55	3	21	5	35	165	3, 37
56	3	24	5	40	168	0, 01
57	3	27	5	45	171	2, 71
58	3	30	5	50	174	11, 41
59	2	32	3,33	53,33	118	17, 41
60	2	34	3,33	56,66	120	31, 21
61	2	36	3,33	59, 99	124	70, 81
63	5	41	8,33	68, 32	315	241, 51
64	3	44	5	73,32	192	189, 61
65	3	47	5	78,32	195	240, 37
66	4	51	6,67	84, 99	264	396, 01
67	1	52	1,67	86,66	67	119, 90
68	2	54	3,33	89, 99	136	285, 61
69	2	56	3,33	93,32	138	335, 41
70	4	60	6,68	100	280	778, 41
	$\Sigma = 60$		$\Sigma = 100\%$		$\Sigma = 3558$	$\Sigma = 3092,4$

$\bar{X} = 3558/60 = 59,3$

$mdl = (58+59)/2 = 58,5$

Moda = 57

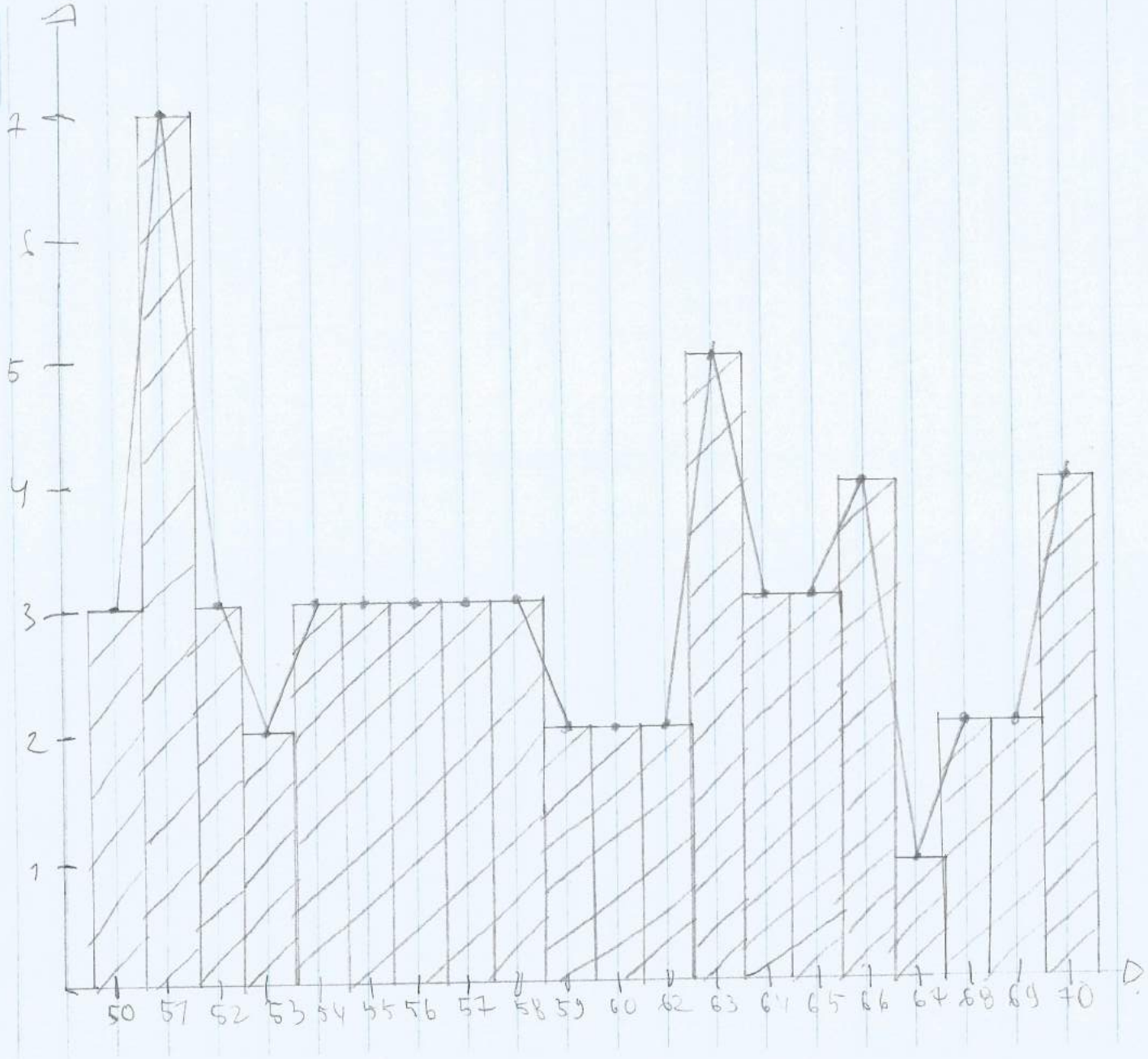
$Var = S_x^2 = (3092,4)/59$

$Var = 52,41$

desv. padrão $= \sqrt{S_x}$

$= \sqrt{52,41}$

$= 7,24$


7
5
4
3
2
1
50 51 52 53 54 55 56 57 58 59 60 62 63 64 65 66 67 68 69 70

Exercício 5)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
2	5	5	5	5	10	243,60
3	4	9	4	9	12	143,04
4	11	20	11	20	44	272,80
5	5	25	5	25	25	79,20
6	11	36	11	36	66	97,68
7	12	48	12	48	84	47,05
8	2	50	2	50	16	1,92
9	5	55	5	55	45	0,00
10	9	64	9	64	90	9,36
11	5	69	5	69	55	20,40
12	6	75	6	75	72	54,72
13	6	81	6	81	78	96,96
14	4	85	4	85	56	100,80
15	3	88	3	88	45	108,72
16	4	92	4	92	64	197,12
17	8	100	8	100	136	574,56
	$\Sigma = 100$		$\Sigma = 100\%$		$\Sigma = 898$	$\Sigma = 1977,93$

$\bar{X} = 898/100 = 8,98$

$md = 8,5$

moda = 7

$Var = S_x^2 = 1977,93/99$

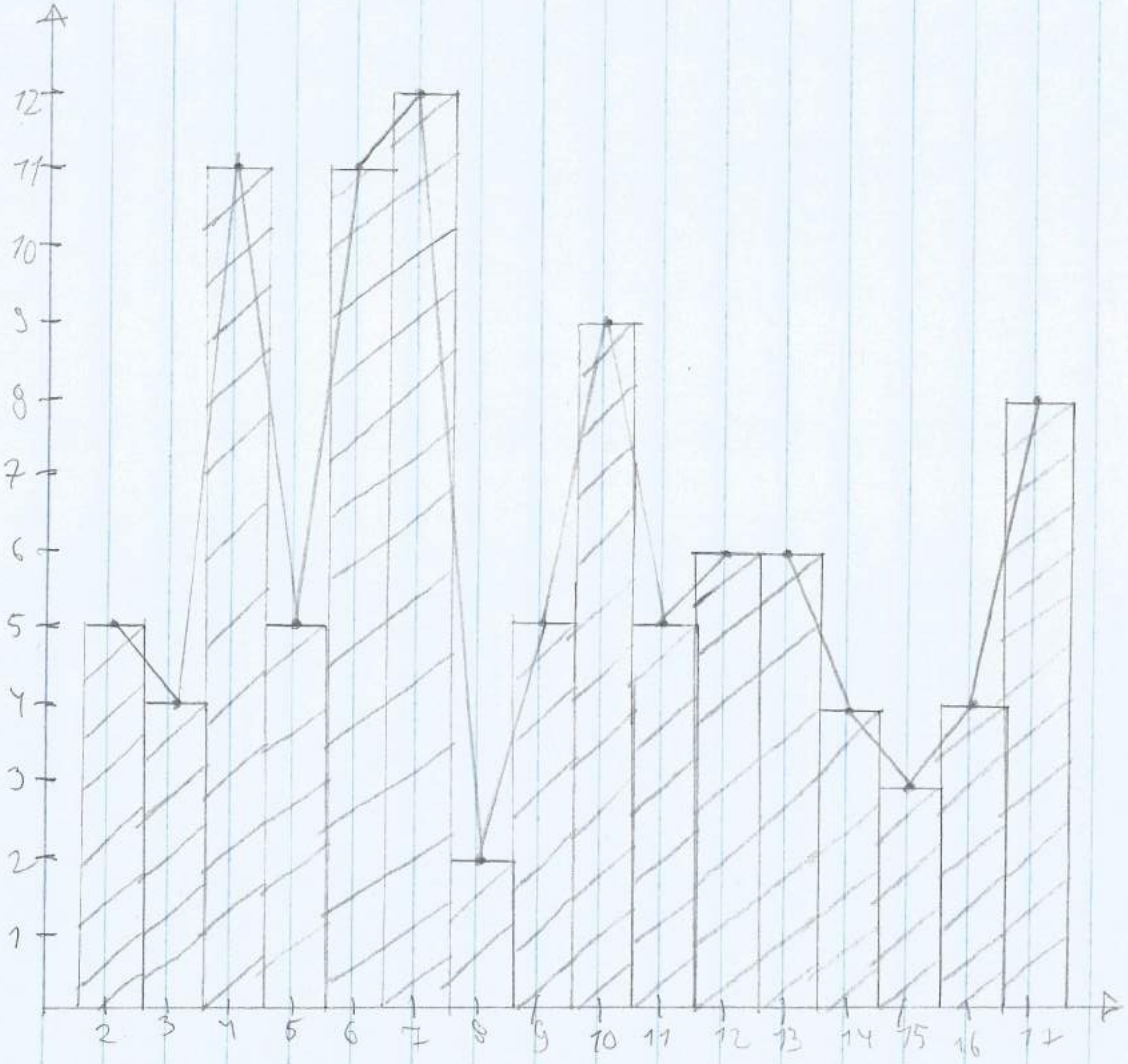
$Var = 19,98$ X

desvio padrão $= \sqrt{S_x}$

$= \sqrt{19,98}$

$= 4,47$

X


12
11
10
9
8
7
6
5
4
3
2
1
2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Exercício 6)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
5	1	1	3,85	3,85	5	38,87
7	5	6	19,23	23,08	35	89,46
8	4	10	15,38	38,46	32	41,73
9	3	13	11,54	50,00	27	14,92
10	3	16	11,54	61,54	30	4,54
12	3	19	11,54	73,08	36	1,78
15	2	21	7,69	80,77	30	28,43
18	3	24	11,54	92,31	54	137,50
20	1	25	3,85	96,16	20	76,91
23	1	26	3,84	100,00	23	138,53
	$\Sigma = 26$		$\Sigma = 100$		$\Sigma = 292$	$\Sigma = 572,67$

$\bar{X} = 292/26 = 11,23$

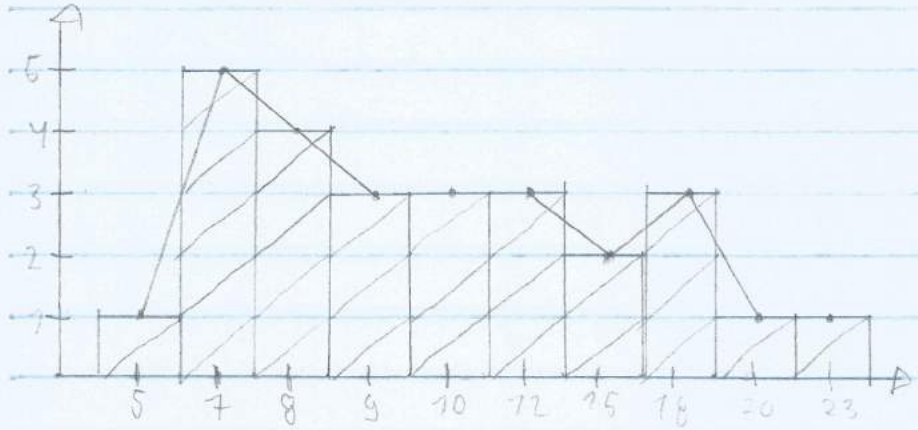
$Md = 9,5$

$Moda = 7$

$Var = S_x^2 = 572,67/25$

$Var = 22,9$

$desv.padrão = \sqrt{S_x^2} = \sqrt{22,9} = 4,79.$



Exercício 7)

x_i	y_i	F_i	f_r (%)	F_r (%)	$x_i \cdot y_i$	$(x_i - \bar{x})^2 \cdot y_i$
13	1	1	5	5	13	156,25
14	3	4	15	20	42	396,75
15	1	5	5	25	15	110,25
16	2	7	10	35	32	180,50
20	1	8	5	40	20	30,25
23	2	10	10	50	46	72,50
24	1	11	5	55	24	2,25
27	2	13	10	65	54	4,50
31	1	14	5	70	31	30,25
32	1	15	5	75	32	42,25
35	1	16	5	80	35	90,25
40	1	17	5	85	40	210,25
41	1	18	5	90	41	240,25
42	1	19	5	95	42	272,25
43	1	20	5	100	43	306,25
	$\Sigma = 20$		$\Sigma = 100$		$\Sigma = 570$	$\Sigma = 2085$

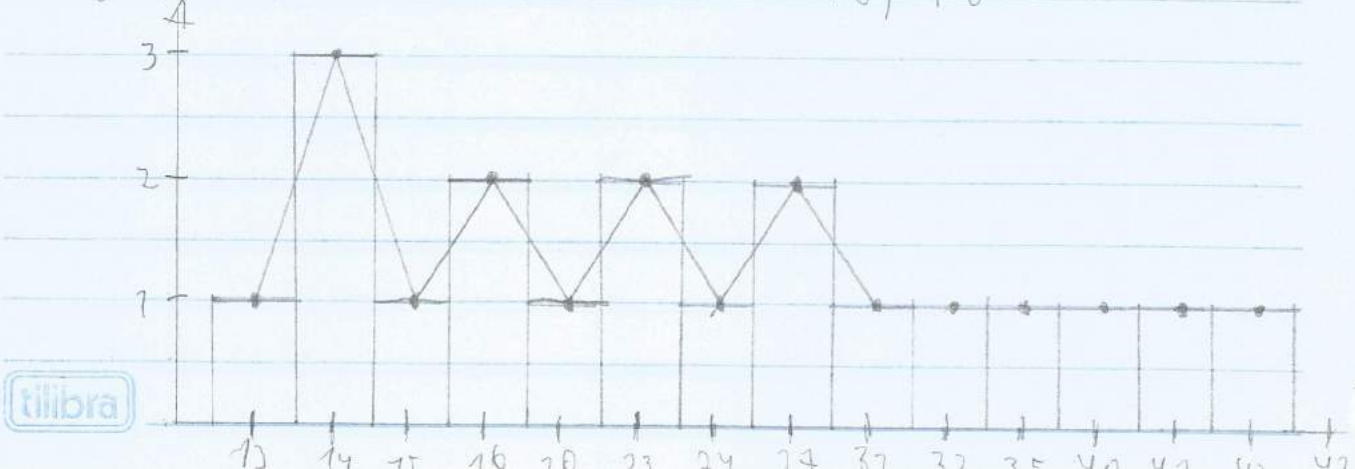
$\bar{X} = 570 / 20 = 25,5$ / $S_x^2 = 2085 / 19 = 109,74$

$md = 23,5$

$Moda = 14$

des. pad. $= \sqrt{S_x^2} = \sqrt{109,74}$

$= 10,48$



Exercício 8)

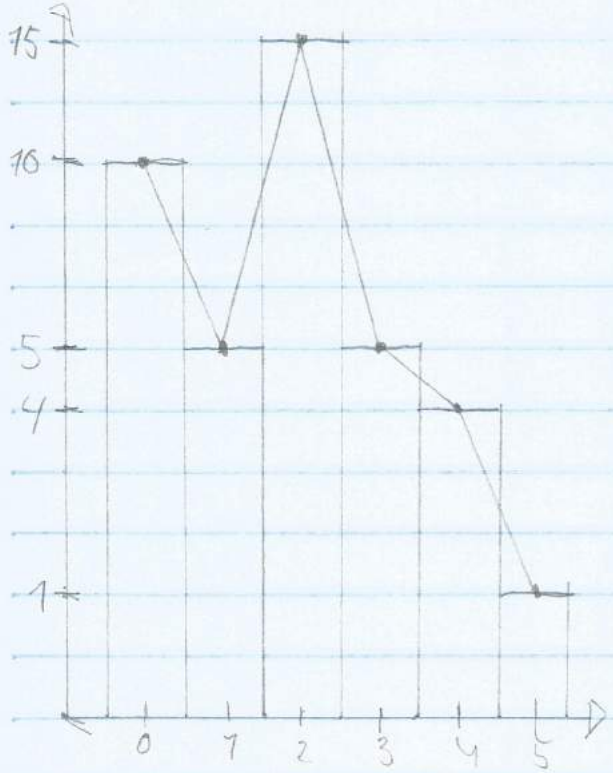
x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
0	10	10	25	25	0	31,68
1	5	15	12,5	37,5	5	3,04
2	15	30	37,5	75	30	0,73
3	5	35	12,5	87,5	15	7,44
4	4	39	10	97,5	16	19,71
5	1	40	2,5	100	5	10,37
	$\sum = 40$		$\sum = 100$		$\sum = 71$	$\sum = 72,97$

$\bar{x} = 71/40 = 1,78$ / $S_x^2 = 72,97/39 = 1,87$

$md = 2$

$moda = 2$

$S_x = \sqrt{1,87} = 1,37$



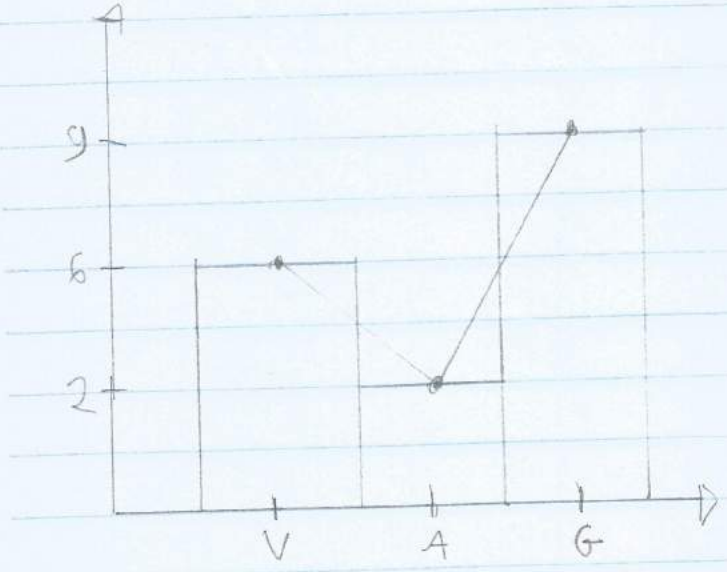
Exercício 9)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x})^2 \cdot f_i$
Vila	6	6	35,29	35,29		
Adelino	2	8	11,76	47,05	?	?
Goiás	9	17	52,95	100		
	$\Sigma = 17$		$\Sigma = 100$			

$\bar{x} = ?$

$md = 9 \rightarrow$ Goiás

Moda = Goiás



Exercício 70)

x_i	f_i	F_i	f_r (%)	F_r (%)	$x_i \cdot f_i$	$(x_i - \bar{x}) \cdot f_i$
1	1	1	10	10	1	213,16
5	1	2	10	20	5	111,36
7	2	4	20	40	14	747,92
9	1	5	10	50	9	43,56
15	1	6	10	60	15	0,36
17	1	7	10	70	17	1,96
18	1	8	10	80	18	5,76
23	1	9	10	90	23	54,76
54	1	10	10	100	54	1474,56
	$\sum = 10$		$\sum = 100$		$\sum = 156$	2054,4

$\bar{x} = 156/10 = 15,6$
$md = (9+15)/2 = 12$
$moda = 7$

$S_x^2 = 2054,4/9 = 228,27$
$S_x = \sqrt{228,27} = 15,11$