

3º ESO

$\bar{X} = \frac{320}{30} = 10.67$
 $Mo = 10$
 $\frac{30}{2} = 15 \rightarrow Me = 10$
 $25\% \text{ de } 30 = 7.5 \rightarrow Q_1 = 7$
 $75\% \text{ de } 30 = 22.5 \rightarrow Q_3 = 14$
 $Var = \frac{4112}{30} - 10.67^2 = 23.29$
 $\sigma = \sqrt{23.29} = 4.8$
 $CV = \frac{4.8}{10.67} = 0.45 \rightarrow 45\%$

a)

X_i	f_i	F_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
1	2	2	2	2
2	3	5	6	12
3	2	7	6	18
4	3	10	12	48
5	6	16	30	150
6	2	18	12	72
7	3	21	21	147
8	2	23	16	128
9	3	26	27	243
10	1	27	10	100
	27		142	920

$\bar{X} = \frac{142}{27} = 5.26$
 $Mo = 5$
 $\frac{27}{2} = 13.5 \rightarrow Me = 5$
 $Var = \frac{920}{27} - 5.26^2 = 6.4$
 $\sigma = \sqrt{6.4} = 2.53$

17)

X_i	f_i	F_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
3	1	1	3	9
4	2	3	8	32
5	2	5	10	50
6	1	6	6	36
7	3	9	21	147
8	2	11	16	128
9	2	13	18	162
10	5	18	50	500
11	1	19	11	121
12	1	20	12	144
13	2	22	26	338
14	1	23	14	196
16	2	25	32	512
17	1	26	17	289
18	2	28	36	648
20	2	30	40	800
	30		320	4112

39)

Int.	x_i	f_i	F_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
[0,10)	5	15	15	75	375
[10,20)	15	30	45	450	6750
[20,30)	25	45	90	1125	28125
[30,40)	35	50	140	1750	61250
[40,50)	45	35	175	1575	70875
[50,60)	55	25	200	1375	75625
		200		6350	243000

$\bar{X} = \frac{6350}{200} = 31.75$
 $Mo = 35$
 $\frac{200}{2} = 100 \rightarrow Me = 35$
 $Var = \frac{243000}{200} - 31.75^2 = 206.9$
 $\sigma = \sqrt{206.9} = 14.4$

Como continua

Intervalo	x_i	f_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
[0,5)	2.5	12	30	75
[5,7)	6	14	84	504
[7,9)	8	10	80	640
[9,10)	9.5	4	38	361
		40	232	1580

$\bar{X} = \frac{232}{40} = 5.8$
 $Var = \frac{1580}{40} - 5.8^2 = 5.86$
 $\sigma = \sqrt{5.86} = 2.42$

Se observa que la media y la desviación típica varían un poco.

Como discreta:

X_i	f_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
0	1	0	0
1	1	1	1
2	4	8	16
3	3	9	27
4	3	12	48
5	6	30	150
6	8	48	288
7	6	42	254
8	4	32	256
9	2	18	162
10	2	20	200
	40	220	1442

$\bar{X} = \frac{220}{40} = 5.5$
 $Var = \frac{1442}{40} - 5.5^2 = 5.8$
 $\sigma = \sqrt{5.8} = 2.4$

28)

X_i	f_i	F_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
240	13	13	3120	748800
270	33	46	8910	2405700
300	40	86	12000	3600000
330	35	121	11550	3811500
360	30	151	10800	3888000
390	16	167	6240	2433600
420	20	187	8400	3528000
	187		61020	20415600

a) $\bar{X} = \frac{61020}{187} = 326.31€$
b) $Mo = 300€$
c) $\frac{187}{2} = 93.5 \rightarrow Me = 330€$
d) $Var = \frac{20415600}{187} - 326.31^2 = 2696.1$
 $\sigma = \sqrt{2696.1} = 51.92$

29)

X_i	f_i	F_i	$x_i \cdot f_i$	$x_i^2 \cdot f_i$
0	1	1	0	0
1	6	7	6	6
2	4	11	8	16
3	3	14	9	27
4	6	20	24	96
5	5	25	25	125
6	7	32	42	252
7	4	36	28	196
8	3	39	24	192
9	2	41	18	162
	45		243	1440

$\bar{X} = \frac{243}{45} = 5.4$
 $Mo = 5$
 $45:2 = 22.5 \rightarrow Me = 4$

X_i	0	1	2	3	4
f_i	432	8343	6242	1002	562
F_i	432	8775	15017	16019	16581

- 15- a) 25% de 16581 = 4145,25 $\rightarrow Q_1 = 1$ radio (o ninguna)
 b) 75% de 16581 = 12435,75 $\rightarrow Q_3 = 2$ radios (o menos)
 c) $16581 = 8290,5 \rightarrow Me = 1$ radio
 El 50% de los hogares tiene 1 radio o ninguna

- 16- 25% de 200 = 50 $\rightarrow Q_1 = 38$
 50% de 200 = 100 $\rightarrow Q_2 = Me = 39$
 75% de 200 = 150 $\rightarrow Q_3 = 40$

- 18- $\frac{3+8+5+7+4}{5} = \frac{27}{5} = 5,4$
 $Var = \frac{3^2+8^2+5^2+7^2+4^2}{5} - 5,4^2 = 3,44 \rightarrow \sigma = 1,85 \rightarrow CV = \frac{1,85}{5,4} = 0,34 \rightarrow 34\%$

- $\frac{2+9+4+5+7}{5} = \frac{27}{5} = 5,4$
 $Var = \frac{2^2+9^2+4^2+5^2+7^2}{5} - 5,4^2 = 58,4 \rightarrow \sigma = 7,64 \rightarrow CV = \frac{7,64}{5,4} = 1,415 = 141,5\%$

La dispersión es mayor en el 2º alumno

- 22- $X = 23$ (para que la moda sea 23)
 $\frac{23+17+19+23+y+16}{6} = 20 \Rightarrow 98+y = 120 \Rightarrow y = 22$

- 25- $a = 19$ (para que la moda sea 19)
 $\frac{10+17+19+19+21+b+25}{7} = 19 \Rightarrow \frac{114+b}{7} = 19 \Rightarrow b = 22$

24-

X_i	26	28	30	32
f_i	6	7	4	3
F_i	6	13	17	20
$X_i \cdot f_i$	156	196	120	96
				568

- a) $\bar{X}_{nueva} = 3 \cdot \bar{X} = 85,2$
 $Me_{nueva} = 3 \cdot Me = 84$
 $Mo_{nueva} = 3 \cdot Mo = 84$

- $\bar{X} = \frac{568}{20} = 28,4$
 $Me = \frac{28}{2} = 10 \rightarrow Me = 28$
 $Mo = 28$
 $Q_1: 25\% \text{ de } 20 = 5 \rightarrow Q_1 = 26$
 $Q_3: 75\% \text{ de } 20 = 15 \rightarrow Q_3 = 30$

26-

Peso	X_i	f_i	F_i	$X_i \cdot f_i$	$X_i^2 \cdot f_i$
[41, 47)	44	5	5	220	9680
[47, 53)	50	6	11	300	15000
[53, 59)	56	1	12	56	3136
[59, 65)	62	4	16	248	15376
		4	20	242	18496
				1096	61636

- $\bar{X} = \frac{1096}{20} = 54,8$
 $Me = \frac{20}{2} = 10 \rightarrow Me = 50$
 $Mo = 50$
 $Var = \frac{61636}{20} - 54,8^2 = 8136$
 $\sigma = \sqrt{8136} = 90,2$

- 30- Alberto: $\frac{4+6+6+7+5}{5} = \frac{28}{5} = 5,6 = \bar{X}$
 $\frac{4^2+6^2+6^2+7^2+5^2}{5} - 5,6^2 = 10,4 = Var \rightarrow \sigma = \sqrt{10,4} = 3,22 \rightarrow$
 $\rightarrow CV = \frac{3,22}{5,6} = 0,575 = 57,5\%$

- Ana: $\bar{X} = \frac{43+62+60+50+55}{5} = \frac{270}{5} = 54$
 $Var = \frac{43^2+62^2+60^2+50^2+55^2}{5} - 54^2 = 4716 \rightarrow \sigma = \sqrt{4716} = 68,7 \rightarrow$
 $\rightarrow CV = \frac{68,7}{54} = 1,27 = 127\%$
 Es más regular Ana.