

« exercises for find the mean, median, mode, variance and the range »

How to use calculator:

CASIO fx-991ES PLUS and fx-82ES -1 (لونها رمادي)

الآلة من نوع

أ. التأكد من ان الآلة الحاسبة لا تحتوي على اي بيانات مخزنة مسبقا وذلك بعمل مايلي

**مسح البيانات من الذاكرة

Push Shift → 9

→ to see Clear → Push 3 = → Push AC

**تحويل الآلة الحاسبة إلى الاستخدام الإحصائي

Push Mode → to see stat → Push 3 =

**ادخال البيانات

1. الحالة الاولى لو كانت البيانات بهذه الصورة

[Data: 3, 5, 8, 9]

Push Shift → 1

→ to see Data → Push 2

سوف يظهر عمود اسمه X والصفوف مرقمة

نكتب باول صف عند رقم 1 اول قيمة 3 وهكذا

3 [=] 5 [=] 8 [=] 9 [=] → Push AC

**إيجاد الوسط الحسابي والانحراف المعياري والتباين

Push Shift **1**

→ to see Var → Push 4

سوف تظهر شاشة بهذه الصورة

1:n	2: \bar{x}
3: $\sigma_x (x\sigma n)$	4: $s_x (x\sigma n-1)$

Then,

Push 2 = → get \bar{x}

Push 3 = → get σ

Push 4 = → get S

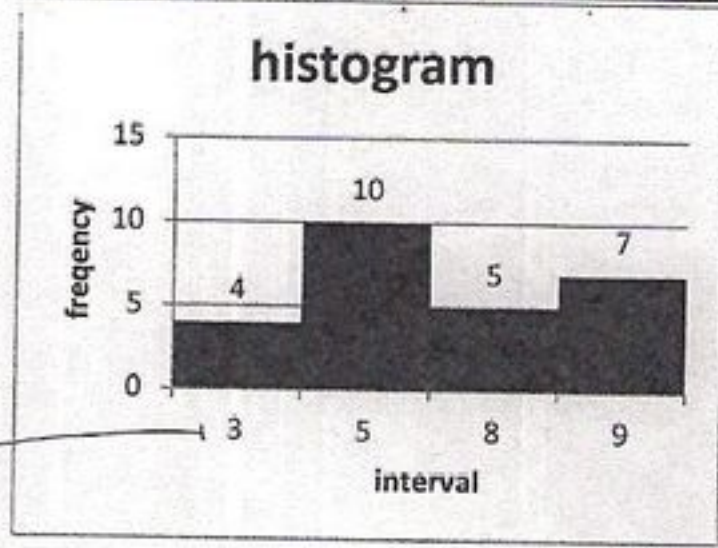
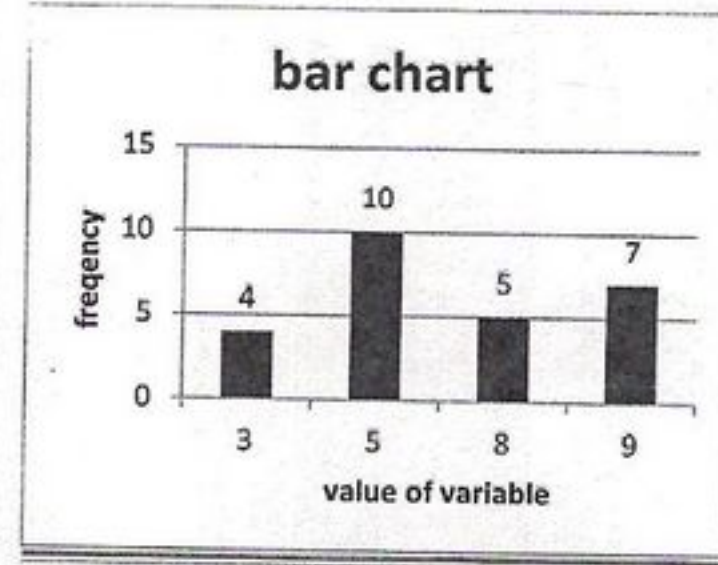
Where S: Sample standard deviation

To get S^2 : Sample variance, just square S.

2. الحالة الاولى لو كانت البيانات اما في Tables or Chart

سوف نأخذ التكرار (frequency) في الاعتبار

Value of variable (discrete variable) or mid interval (continues)	frequency
3	4
5	10
8	5
9	7



they are as midpoint

Push Shift → 1

→ to see type → Push 1 → Push 2

سوف يظهر عمودين x and y والصفوف مرقمة

نضع باول عمود (x) قيم المتغير ونضع قيم التكرار بالعمود y وبنفس الترتيب

يعني القيمة 3 بالصف الاول بالعمود x وقيمة التكرار له 4 نضعها بنفس الصف بالعمود y وهكذا

بالعمود x نكتب

3 = 5 = 8 = 9 =

وبالاسهم ننتقل الى العمود y ونكتب من اول صف

4 $\boxed{=}$ 10 $\boxed{=}$ 5 $\boxed{=}$ 7 $\boxed{=}$ \longrightarrow Push AC

**ايجاد الوسط الحسابي

Push Shift $\boxed{1}$

\longrightarrow to see Sum \longrightarrow Push 3

\longrightarrow to see الشاشة

1: Σx^2	2: Σx
3: Σy^2	4: Σy
5: Σxy	6: Σx^3
7: $\Sigma x^2 y$	8: Σx^4

Then,

Push 5 = \longrightarrow get Σxf

Push 4 = \longrightarrow get Σf

ولايجاد الوسط الحسابي نوجد

$$\bar{x} = \frac{\Sigma xf}{\Sigma f} = \frac{\Sigma xy}{\Sigma y}$$

وللايجاد تباين العينة نوجد:

$$s^2 = \frac{(\Sigma x^2 y) - (\Sigma y)(\bar{x})^2}{(\Sigma y) - 1}$$

وبالتالي الانحراف المعياري للعينة هو: $s = \sqrt{s^2}$

How to use calculator:

1- الآلة من نوع CASIO fx-991MS (لونها اسود)

أ. التاكيد من ان الآلة الحاسبة لا تحتوي على اي بيانات مخزنة مسبقا وذلك بعمل مايلي

**مسح البيانات من الذاكرة

Push Shift → Mode

→ to see Sci → Push 3 = → Push AC

**تحويل الآلة الحاسبة إلى الاستخدام الإحصائي

Push Mode → Push Mode

→ to see SD → Push 1 =

**ادخال البيانات

الحالة الأولى لو كانت البيانات

.1

بهذه الصورة

[Data: 3, 5, 8, 9]

3 \overline{M}^+ 5 \overline{M}^+ 8 \overline{M}^+ 9 \overline{M}^+ → Push AC

**ايجاد الوسط الحسابي والانحراف المعياري والتباين

Push Shift $\boxed{2}$

→ to see الشاشة

\bar{x}	$x_{\sigma n}$	$x_{\sigma n-1}$
1	2	3

Then,

Push 1 = \longrightarrow get \bar{X}

Push 2 = \longrightarrow get σ

Push 3 = \longrightarrow get S

Where S : Sample standard deviation

To get S^2 : Sample variance, just square S .

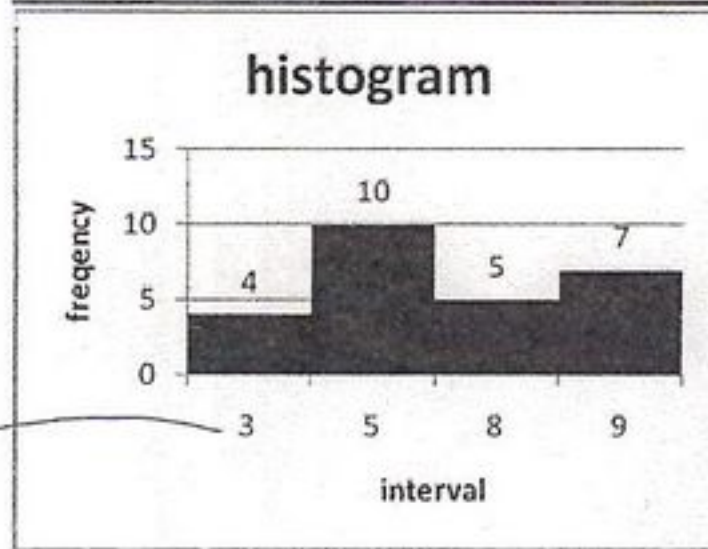
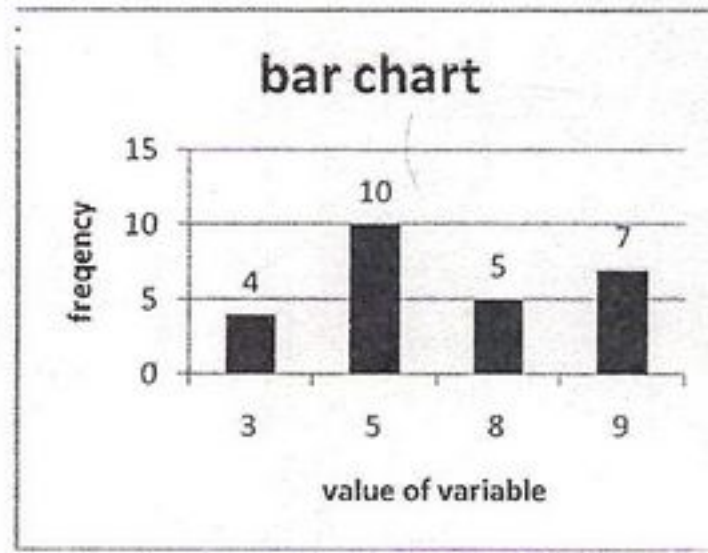
الحاله الاولى لو كانت البيانات

.2

اما في Tables or Chart

سوف نأخذ التكرار (frequency) في الاعتبار

Value of variable (discrete variable) or mid interval (continues)	frequency
3	4
5	10
8	5
9	7



They are as midpoint

سوف يكون ادخال البيانات في هذه الحالة كما يلي

3 Push Shift $\boxed{4}$ $\boxed{M^+}$ 5 Push Shift $\boxed{10}$ $\boxed{M^+}$ 8

Push Shift $\boxed{5}$ $\boxed{M^+}$ 9 Push Shift $\boxed{7}$ $\boxed{M^+}$

Push AC

** ايجاد الوسط الحسابي والانحراف المعياري والتباين

Push Shift $\boxed{2}$

→ to see الشاشة

\bar{x}	$x_{\sigma n}$	$x_{\sigma n-1}$
1	2	3

Then,

Push 1 = \longrightarrow get \bar{X}

Push 2 = \longrightarrow get σ

Push 3 = \longrightarrow get S

Where S: Sample standard deviation

To get S^2 : Sample variance, just square S.

Q# 1) We measure the number of asthma cases seen in the past months for a sample of hospital:

20 16 30 14 20 35 6 29 20 25 49 15

[1] The type of the variable is:

- (a) qualitative (b) continuous (c) number (d) normal discrete (f) statistic

[2] The sample mean is:

- (a) 20 (b) 30 (c) 24 23.25 (e) 20.5 (f) 2.5

[3] The sample mode is:

- (a) 16 (b) 49 (c) 35 (d) 25 20 (f) no mode

[4] The sample median is:

- (a) 16 (b) 25 20 (d) 35 (e) 30 (f) 49

[5] The sample standard deviation is:

- (a) 10 (b) 23.25 (c) 128.93 (d) 7905 (e) 279 11.355

Q# 2) For a sample of size 15 women, here are the numbers of their children:

3 5 2 1 4 3 5 4 0 1 2 6 4 0 2

[1] The type of the variable is:

- (a) qualitative (b) continuous (c) number (d) normal discrete (f) statistic

[2] The sample mean is:

- (a) 3 (b) 6 (c) 7.84 2.8 (e) 2.5 (f) 0

[3] The sample median is:

- 3 (b) 2 (c) 3.5 (d) 7.5 (e) 2.5 (f) 1.5

[4] The sample mode is:

- (a) 6 2 and 4 (c) 2, 3 and 4 (d) 3 (e) 5 (f) no mode

[5] The sample standard deviation is:

- (a) 166 (b) 3.457 (c) 1.364 (d) 1.796 1.859 (f) 1



لا يكتب في
هذا الهامش

"Q#1"

1) the variable is the # of asthma cases seen in past months in hospital, so the type of it is quantitative discrete. i.e.

For 2, 3, 4, and 5 we doing the following:

# of asthma cases	Frequency	order of the sample data
6	1	$X_{(1)}$
14	1	$X_{(2)}$
15	1	$X_{(3)}$
16	1	$X_{(4)}$
20	3	$X_{(5)}, X_{(6)}, X_{(7)}$
25	1	$X_{(8)}$
29	1	$X_{(9)}$
30	1	$X_{(10)}$
35	1	$X_{(11)}$
49	1	$X_{(12)}$
total	$n=12$	

2) by using the calculator we get $\bar{X} = 23.25$ $\therefore d$

3) the sample mode is the value of the # of asthma cases in past months who has the largest frequency, so it is 20. $\therefore c$

4) as the sample size is even which is $n=12$ then

$$\text{median} = \left(X_{\left(\frac{n}{2}\right)} + X_{\left(\frac{n}{2}+1\right)} \right) / 2 = \left(X_{\left(\frac{12}{2}\right)} + X_{\left(\frac{12}{2}+1\right)} \right) / 2$$

$$= \left(X_{(6)} + X_{(7)} \right) / 2 = (20 + 20) / 2 = 40 / 2 = 20 \quad \therefore c$$

5) by using the calculator we get $S_x = 11.255$ $\therefore f$



لا يكتب في
هذا الهامش

1) The variable is the number of children for 15 women, so the type of it is quantitative-discrete. ∴ e

For 2, 3, 4 and 5 we doing the following:

# of children	frequency	order of the sample data
0	2	$X_{(1)}, X_{(2)}$
1	2	$X_{(3)}, X_{(4)}$
2	3	$X_{(5)}, X_{(6)}, X_{(7)}$
3	2	$X_{(8)}, X_{(9)}$
4	3	$X_{(10)}, X_{(11)}, X_{(12)}$
5	2	$X_{(13)}, X_{(14)}$
6	1	$X_{(15)}$
total	15 women	

Note that the difference between ordered sample and un-ordered sample:

un-ordered sample...

$X_1=3, X_2=5, X_3=2, X_4=1, X_5=4, X_6=3, X_7=5, X_8=4, X_9=0, X_{10}=1, X_{11}=2, X_{12}=6, X_{13}=4, X_{14}=0, X_{15}=2$ (as is given exactly in the question)

ordered sample...

$X_{(1)}=0, X_{(2)}=0, X_{(3)}=1, X_{(4)}=1, X_{(5)}=2, X_{(6)}=2, X_{(7)}=2, X_{(8)}=3, X_{(9)}=3, X_{(10)}=4, X_{(11)}=4, X_{(12)}=4, X_{(13)}=5, X_{(14)}=5, X_{(15)}=6$

2) by using the calculator we get $\bar{x} = 2.8$ ∴ d

3) as the sample size is odd which is $n=15$ then

$$\text{median} = X_{\left(\frac{n+1}{2}\right)} = X_{\left(\frac{15+1}{2}\right)} = X_{\left(\frac{16}{2}\right)} = X_{(8)} = 3 \quad \therefore a$$

4) the sample mode is the value of the # of the children who has the largest frequency, so we have two sample mode which they 2 and 4

∴ b

5) by using the calculator we get $s_x = 1.859$ ∴ d

Q#3) a machine is producing metal pieces that are cylindrical in shape.
 a random sample of size 5 is taken and diameters are:

1.70, 2.11, 2.2, 2.31, 2.28

then

a) the sample mean $= \bar{x} = 2.12$

b) the sample variance $= s^2 = .06115$

x_i	f_i	
1.7	1	$X_{(1)}$
2.11	1	$X_{(2)}$
2.2	1	$X_{(3)}$
2.28	1	$X_{(4)}$
2.31	1	$X_{(5)}$
Sum=5		

Q#4) we measure the number of absence days in semester from a sample of students in a certain school,

4, 10, 3, 5, 6, 11, 7, 4, 2, 9, 8, 12

a) the sample mean $= \bar{x} = 6.75$

b) the sample mode = 4

c) the sample median $= \frac{X_{(\frac{12}{2})} + X_{(\frac{12}{2}+1)}}{2} = \frac{X_{(6)} + X_{(7)}}{2} = \frac{6+7}{2} = \frac{13}{2} = 6.5$

d) the sample standard deviation $= s = 3.27871$

e) the sample variance $= s^2 = 10.75$

f) the sample range $= X_{(12)} - X_{(1)} = 12 - 2 = 10$

x_i	f_i	
2	1	$X_{(1)}$
3	1	$X_{(2)}$
4	2	$X_{(3)}, X_{(4)}$
5	1	$X_{(5)}$
6	1	$X_{(6)}$
7	1	$X_{(7)}$
8	1	$X_{(8)}$
9	1	$X_{(9)}$
10	1	$X_{(10)}$
11	1	$X_{(11)}$
12	1	$X_{(12)}$
Sum=12		

Q#5) The following are hemoglobin levels of a sample of 9 children from a certain disease;

6.7, 9.1, 10, 11.4, 12.4, 9.8, 8.3, 9.9, 9.1

The sample mean $= \bar{X} = 9.6333$

The sample median $= 9.8 = X_{(\frac{9+1}{2})} = X_{(5)}$

The sample mode $= 9.1$

The sample range $= 12.4 - 6.7 = 5.7$

The sample standard deviation $= 1.6568 = s$

The sample variance $= 2.745 = s^2$

x_i	f_i	
6.7	1	$X_{(1)}$
8.3	1	$X_{(2)}$
9.1	2	$X_{(3)}, X_{(4)}$
9.8	1	$X_{(5)}$
9.9	1	$X_{(6)}$
10	1	$X_{(7)}$
11.4	1	$X_{(8)}$
12.4	1	$X_{(9)}$
	Sum = 9	