

Mean of a frequency distribution

<https://mystatclass.com>

Question: Use the given frequency distribution to approximate the mean:

Class	Frequency
0-19	8
20-39	9
40-59	9
60-79	17
80-99	16

First, find the class midpoint for each class by adding the class 's limits and dividing the result by two, as follows:

$$\text{Class 0-19: } Xm = \frac{0+19}{2} = 9.5$$

$$\text{Class 20-39: } Xm = \frac{20+39}{2} = 29.5$$

Notice that if we add the class width, 20, to the first class midpoint we obtain the next class midpoint. These are the results:

<i>Class</i>	<i>Xm</i>	<i>Frequency</i>
0-19	9.5	8
20-39	29.5	9
40-59	49.5	9
60-79	69.5	17
80-99	89.5	16

Having the midpoints calculated, if you are using the formula for the mean of a frequency distribution,

$$\bar{x} = \frac{\sum Xm \cdot f}{\sum f} \quad \text{where } f \text{ stands for frequency.}$$

Omitting the column of classes which is no longer needed, our calculations are:

<i>Xm</i>	<i>Frequency</i>	<i>Xm · f</i>
9.5	8	76
29.5	9	265.5
49.5	9	445.5
69.5	17	1181.5
89.5	16	1432

$$\sum Xm \cdot f = 76 + 265.5 + 445.5 + 1181.5 + 1432 = 3400.5 \quad \text{And} \quad \sum f = 8 + 9 + 9 + 17 + 16 = 59$$

Substituting into the formula:

$$\bar{x} = \frac{\sum Xm \cdot f}{\sum f} = \frac{3400.5}{59} \approx 57.6$$

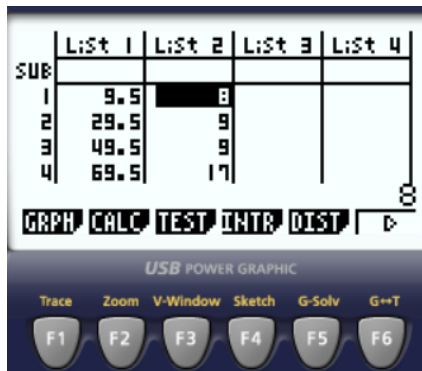
Which is the answer.

On graphing Calculators, use STAT mode:

Enter Xm values on $L1$ and Frequencies on $L2$:

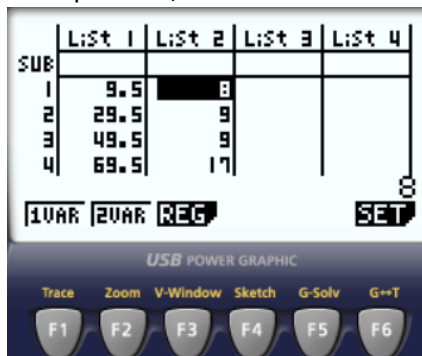
$L1$	$L2$
9.5	8
29.5	9
49.5	9
69.5	17
89.5	16

On Casio **9750GII** looks like this:



[On the screenshot only four values are visible; but all five have been input.]

Then press F2, for CALC:



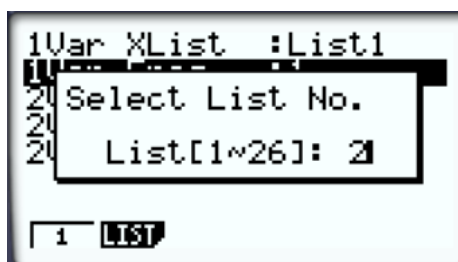
Then, F6 in order to Setup the lists:



We are working with 1VAR (One Variable); therefore, do not pay attention to 2VAR. Now, in 1VAR this time we need 1VAR Freq to be List2, since the frequencies have been included on List2. So, using the arrow keys navigate to 1VAR Freq and press F2 for LIST,



Enter a 2, meaning List2:



Press EXE. This is what we need:



Press EXE again, obtaining:

	List 1	List 2	List 3	List 4
SUB				
1	9.5	8		
2	29.5	9		
3	49.5	9		
4	69.5	17		

8

1VAR 2VAR REG SET

USB POWER GRAPHIC

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F1 F2 F3 F4 F5 F6

Now, Press F1 for 1Var descriptive statistics:

1-Variable	
\bar{x}	=57.6355932
Σx	=3400.5
Σx^2	=240884.75
σx	=27.5849735
sx	=27.8217588
n	=59

↓

The mean, $\bar{x} = 57.6355932$, to one decimal place is ≈ 57.6



On the TI84 update L1 & L2:

L1	L2
9.5	8
29.5	9
49.5	9
69.5	17
89.5	16

Like this:

L1	L2	L3	L4	L5
9.5	8	-----	-----	-----
29.5	9			
49.5	9			
69.5	17			
89.5	16			
-----	-----			

L2(1)=8

Then, press STAT

```
EDIT CALC TESTS
1:Edit...
2:SortA(
3:SortD(
4:ClrList
5:SetUpEditor
```

Now, use the arrow keys and move over CALC:

```
EDIT CALC TESTS
1:1-Var Stats
2:2-Var Stats
3:Med-Med
4:LinReg(ax+b)
5:QuadReg
6:CubicReg
7:QuartReg
8:LinReg(a+bx)
9↓LnReg
```

Since we are doing 1VAR Statistics, press enter:

```
NORMAL FLOAT AUTO REAL RADIAN MP
1-Var Stats
List:L1
FreqList:
Calculate
```

Again, using the arrow keys, select FreqList and press 2ND and key number 2:

Now List2 appears as FreqList.

```
1-Var Stats
List:L1
FreqList:L2
Calculate
```

Use the arrow keys again, select Calculate and press enter. It yields:

```
1-Var Stats
x̄=57.63559322
Σx=3400.5
Σx²=240884.75
Sx=27.82175881
σx=27.58497357
n=59
minX=9.5
↓Q1=29.5
```

The mean, $\bar{x} = 57.63559322$, to one decimal place is ≈ 57.6