

## Lesson #5

Aim: How do we calculate the mean and STANDARD DEVIATION of Grouped Data?

Do Now :

CLASSES	frequency	Midpoint
64-67	1	65.5
68-71	38	69.5
72-75	12	73.5

or  $68-64=4$   
 $72-68=4$

## Questions

- ① What is the class length? 4
- ② What is the total frequency 51 (1+38+12)
- ③ Find the midpoint for every class

Note: the midpoint represents the data in each class.

example - How many 69.5 do I show in the table? 38

CLASSES	frequency	Midpoint	Frequency (Midpoint)
64-67	1	65.5	$1 \times 65.5 = 65.5$
68-71	38	69.5	$38 \times 69.5 = 2641$
72-75	12	73.5	$12 \times 73.5 = 882$

$$\bar{x} = \frac{\sum 3588.5}{51} = 70.36 \text{ mean}$$

find the mean

$$\sum = \underbrace{65.5 + 69.5 + 69.5 + 69.5 + 69.5 \dots}_{38} + \underbrace{73.5 + 73.5 \dots}_{12} = 3588.5$$

$$1 + 38 + 12 = 51 = n$$

in the calculator

L1	L2 (FREQ.)
65.5	1
69.5	38
73.5	12

$$L1 \times L2 = \frac{\sum}{n}$$

1-Variable	
$\bar{x}$	= 70.362745
$\sum x$	= 3588.5
$\sum x^2$	= 252666.75
$\sigma x$	= 1.82595242
$sx$	= 1.84412155
n	= 51

CLASSES	frequency	Midpoint	Mean	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
64-67	1	65.5	70.36	$65.5 - 70.36 = -4.86 = 23.62$	
68-71	38	69.5	70.36	$69.5 - 70.36 = -0.86 = 0.74$	
72-75	12	73.5	70.36	$73.5 - 70.36 = 3.14 = 9.86$	

Find the STANDARD DEVIATION (SAMPLE)

$$S = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{170.06}{50}}$$

CLASSES	frequency	Midpoint	Mean	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$	$(x_i - \bar{x})^2 \times \text{Freq.}$
64-67	1	65.5	70.36	$65.5 - 70.36 = -4.86 = 23.62$	$\times 1 = 23.62$	
68-71	38	69.5	70.36	$69.5 - 70.36 = -0.86 = 0.74$	$\times 38 = 28.12$	
72-75	12	73.5	70.36	$73.5 - 70.36 = 3.14 = 9.86$	$\times 12 = 118.32$	
						$\sum \frac{170.06}{50} = 3.40$

VARIANCE = 3.40

STANDARD DEVIATION =  $\sqrt{3.40} = 1.84$



