5.3 Standard Deviation DAY2 – Finding the standard deviation of grouped data (Concept #26)

Example #1:

The following information regarding gaming hours per week for grade 11 students was obtained through a survey at RHS.

a) Find the mean and standard deviation of the data

Hours	Frequency
3-5	7
5-7	11
7-9	16
9-11	19
11-13	12
13-15	5

Step 1: Determine the midpoint of each interval

Step 2: Multiply the midpoint with the frequency

Step 3: Find the mean of the midpoint x frequency (This is the estimated mean)

Step 4: Find the difference between the midpoint and the mean

Step 5: Find the square of the difference between the midpoint and the mean

Step 6: Multiply the squared difference by the frequency

Step 7: Find the mean of the results of the multiplication from step 6 and then take the square root of that number.

$$\sigma = \sqrt{\frac{\Sigma(x-\bar{x})^2}{n}}$$

HOURS (x)	FREQUENCY	FIND: MIDPOINT of HOURS (these are your values of x) *#of hours they played video games*	FIND: MIDPOINT multiplied by FREQUENCY	FIND: $(x - \bar{x})$ (Midpoint –Mean)	FIND: $(x - \bar{x})^2$ Square each term in the previous column	FIND: The previous column multiplied by frequency *this is the square value when x=4 this happened 7 times so must multiply*
3-5	7	4	7x4 = 28	4-8.9 =	$(-4.9)^2=24.01$	$24.01\times7 = 168.07$
5-7	11	6	6x11 = 66	6-8.9 =	$(-2.9)^2=8.41$	$8.41\times11 = 92.51$
7-9	16	8	16x8 = 128	8-8.9 =	$(-0.9)^2=0.81$	$0.81 \times 16 = 12.96$
9-11	19	10	19x10 = 190	10-8.9=	$(1.1)^2= 1.21$	$1.21\times19 = 22.99$
11-13	12	12	12x12 = 144	12-8.9=	$(3.1)^2= 9.61$	$9.61\times12 = 115.32$
13-15	5	14	5x14 = 70	14-8.9=	$(5.1)^2= 26.01$	$26.01\times5 = 130.05$
	Add this column to find n n = ____		**Now find the mean** $\bar{x}$: **Add this column and divide by n** $\bar{x}$ = $\frac{626}{70}$ hours / people $\bar{X}$=8.9 hours/person			**Now find the σ by finding mean of this column** $\bar{x}$ of column = ____ **and then find its' square root.** σ = √____ = _____

The data (# of hours spent playing video games) has a σ=2.7 hours.

$$\sigma = \sqrt{\frac{541.9}{70}}$$

$$\sigma = 2.7 \text{ hours}$$

Assignment Pg 235 #9 and 11