

Mean and Standard Deviation Distributions - Guided Lesson Explanation

Explanation#1

Step1) a. Let x_i be the i th salary and f_i be the corresponding frequency.

$$\text{Mean of grouped data} = \mu = (\sum x_i * f_i) / \sum f_i$$

$$= (3500 * 8 + 4000 * 5 + 4200 * 8 + 4300 * 2 + 4500 * 2) / (8+5+8+2+2)$$

$$= 3968$$

Step 2) b. standard deviation of grouped data = $\sqrt{[(\sum(x_i - \mu)^2 * f_i) / \sum f_i]}$

$$= \sqrt{[(8*(3500 - 3968)^2 + 5*(4000 - 3968)^2 + 8*(4200 - 3968)^2 +$$

$$2*(4300 - 3968)^2 + 2*(4500 - 3968)^2] / (25)}$$

$$= 345 \text{ (rounded to the nearest unit).}$$

Explanation#2

Step1) a. Mean of Data Set A = $(5 + 6 + 3 + 9 + 2) / 5 = 5$

$$\text{Mean of Data Set B} = (7 + 10 + 18 + 20 + 20) / 5 = 15$$

Step 2) b. Standard Deviation Data Set A

$$= \sqrt{[(5 - 5)^2 + (6 - 5)^2 + (3 - 5)^2 + (9 - 5)^2 + (2 - 5)^2] \div 5} = 2.45$$

Standard Deviation Data Set B

$$= \sqrt{[(7 - 15)^2 + (10 - 15)^2 + (18 - 15)^2 + (20 - 15)^2 + (20 - 15)^2] \div 5} = 5.44$$

c. Data Set B has largest standard Deviation.

d. Yes. Data set B has values further away from mean than A.



Name _____

Date _____

Explanation#3

Step1) a. Let x_i be the i th salary and f_i be the corresponding frequency.

$$\begin{aligned}\text{Mean of grouped data} &= \mu = (\sum x_i * f_i) / \sum f_i \\ &= (1500 * 3 + 6500 * 5 + 2400 * 2) / (3+5+2) \\ &= 4180\end{aligned}$$

$$\begin{aligned}\text{Step 2) b. standard deviation of grouped data} &= \sqrt{[(\sum(x_i-\mu)^2 * f_i) / \sum f_i]} \\ &= \sqrt{[(3*(1500 - 4180)^2 + 5*(6500 - 4180)^2 + 2*(2400 - 4180)^2) / (10)]} \\ &= 2341 \text{ (rounded to the nearest unit).}\end{aligned}$$

