Statistics Unit 1 worksheet: Computing a standard deviation, sample and population

Name _____ Date _____ Period _____

1. The five teachers in a small school's music department have taught for these numbers of years: 6, 8, 11, 12, 18. The five are the whole department, the group being described. Find the standard deviation of their years of teaching, to two decimal places.

2. A beekeeper has 60 hives. To estimate the spread of the honey harvest across all of them, she weighs the honey from 4 hives chosen at random: 9, 12, 14, 18 kg. Find the standard deviation of the harvest, to two decimal places.

3. A school has 600 students. Kevin asked a random sample of 25 of them how many pets they have.

pets x	0	1	2	3
students f	4	10	8	3

He found $\bar{x} = 1.4$ and a column of fd^2 that adds to 20, both correct. Then he wrote $s = \sqrt{\frac{20}{3}} \approx 2.58$ pets.

(a) What is Kevin's mistake?

(b) Find the correct standard deviation, to two decimal places.

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4. A ferry company times a random sample of its crossings, in minutes. The squared deviations from the sample mean add to 224, and the sample standard deviation is exactly $s = 4$ minutes.

(a) How many crossings are in the sample?

(b) What would dividing by the number of crossings, instead of one less, have given? Give it to two decimal places.

5. The five students in a pottery class made 4, 8, 9, 11 and 13 bowls this term. Treat the class as a population.

(a) Find the standard deviation of the number of bowls, to two decimal places.

(b) A sixth student joins the class and has made 9 bowls. Find the standard deviation for the six students.

(c) No student's count changed, yet the standard deviation did. Explain why it went the way it did.

6. Data set A is 3, 5, 10. Data set B lists each of those numbers twice: 3, 3, 5, 5, 10, 10.

(a) Treat each set as a population and find σ for each, to two decimal places.

(b) Treat each set as a sample and find s for each, to two decimal places.

(c) Explain why doubling the data left σ alone but changed s.

7. A population of four whole numbers has mean 10 and standard deviation $\sigma = 3$. None of the four numbers is more than 3 away from the mean. Find the four numbers, and explain why no other four numbers work.

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