Foundation
Micron

Algebra: Quality Control
Micron Technology, Inc
Job Description: Develop wafer level test strategies and test programs. Provide failure analysis reporting. Monitor device yields, failure rates, and repair rates. Interact with various engineering and product groups to optimize device yields and minimize costs.
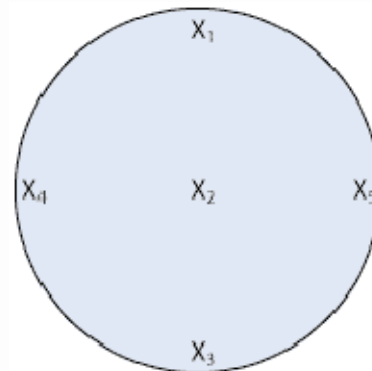
Problem:
The CTE (Center to Edge) range of the readings taken of the center of a wafer and various points on the edge of a wafer after Chemical Mechanical Planarization (CMP) must be calculated and compared with a critical value to determine if the process is accurate. The critical value is 1000.

Determine whether Process A and Process B are accurate (*absolute value is less than* 1000).

	X_1	X_2	X_3	X_4	X_5
Process A	22000	23500	21000	24000	21500
Process B	17000	19000	20000	21000	19700

$$CTE = \left[\frac{X_1 + X_3 + X_4 + X_5}{4} - X_2 \right]$$

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Process A	22000	23500	21000	24000	21500
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Solution:

The CTE range is calculated by finding the difference between the average or *mean* of the readings taken on the edge of the wafer with the reading taken in the center.

	X_1	X_2	X_3	X_4	X_5
Process A	22000	23500	21000	24000	21500
Process B	17000	19000	20000	21000	19700
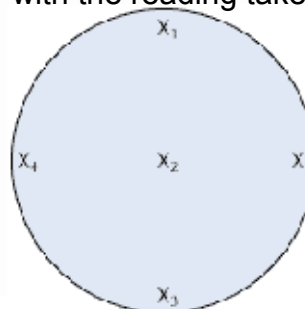
$$CTE_A = \left[\frac{22000 + 21000 + 24000 + 21500}{4} - 23500 \right] = -1375$$

$$CTE_B = \left[\frac{17000 + 20000 + 21000 + 19700}{4} - 19000 \right] = 425$$

Process B is accurate because it has a CTE range less than the critical value of 1000.