81	99	97	81	85	86
99	93	96	83	82	91

81, 81, 82, 83, 85, 86

91, 93, 96, 97, 99, 99

mean → 89.4

S.D. → 6.9

Add 20 to each of the following data values.

81	99	97	81	85	86
99	93	96	83	82	91

101, 101, 102, 103, 105, 106

111, 113, 116, 117, 119, 119

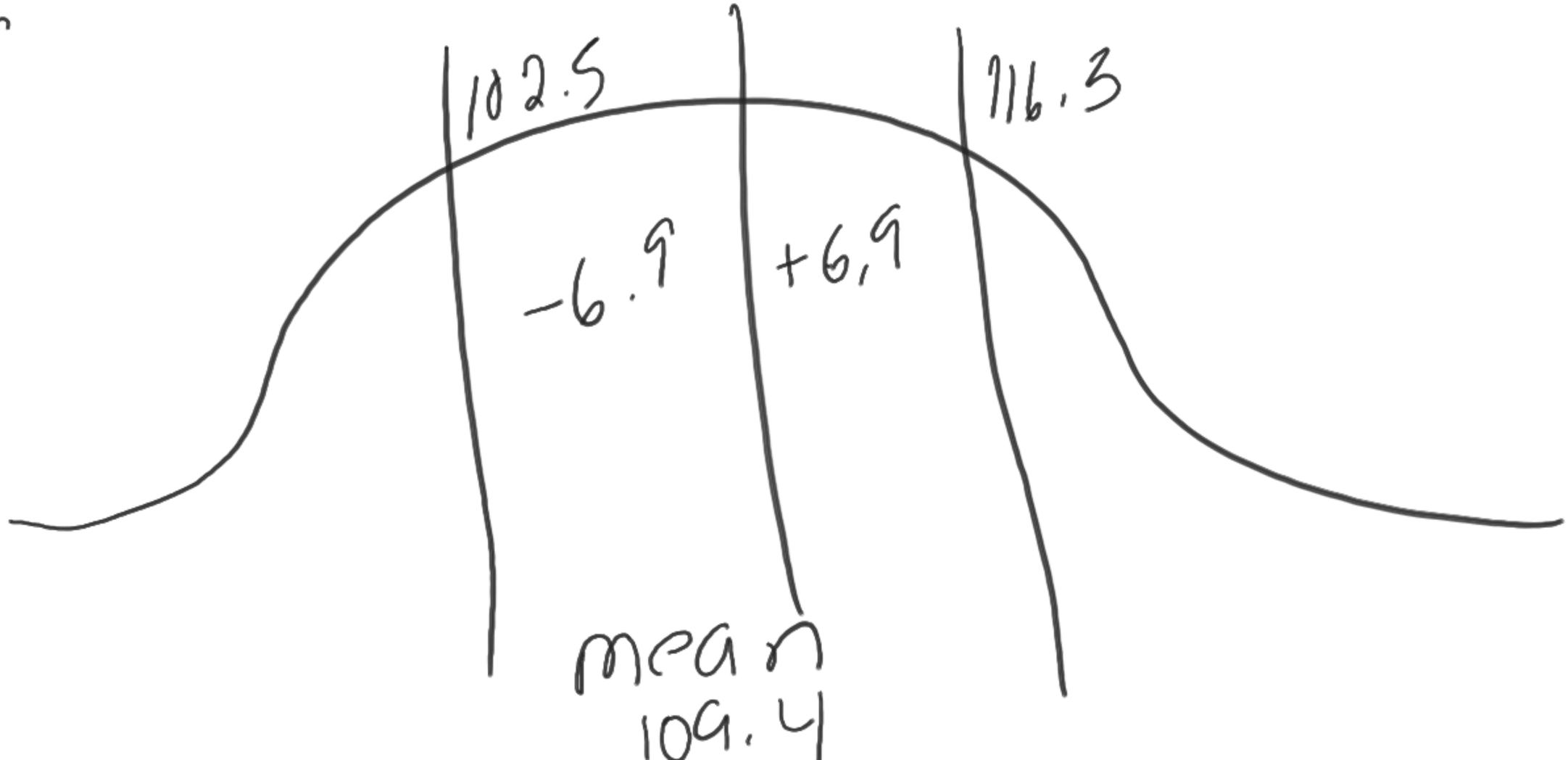
mean → 109.4

S.D → 6.9

101, 101, 102, 103, 105, 106

111, 113, 116, 117, 119, 119

SD = 6.9



The manager of a local diner has calculated his average daily sales to be $4500 with a standard deviation of $750.

a. In what range can the manager expect his daily sales to be 68% of the time?

b. In what range can the manager expect his daily sales to be 95% of the time?

c. In what range can the manager expect his daily sales to be 99.7% of the time?

d. What assumption did you make about daily sales when answering parts **a.**, **b.**, and **c.**?

Coefficient of Variation

For population data, the measure is defined as $CV = \left(\frac{\sigma}{\mu} \cdot 100 \right) \%$,

and for sample data, $CV = \left(\frac{s}{\bar{x}} \cdot 100 \right) \%$.

A consumer interest group is interested in comparing two brands of vitamin C. One brand of vitamin C advertises that its tablets contain 500 mg of vitamin C. The other brand advertises that its tablets contain 250 mg of vitamin C. Tablets for each brand are randomly selected and the milligrams of vitamin C for each tablet are measured with the following results.

Vitamin C Content (mg)		
	Brand A (500 mg)	**Brand B (250 mg)**
$\bar{x}$	500	250
s	10	7

$A = \frac{10}{500}(100)\%$

$A = 2\%$

$B = 2.8\%$

a. Calculate the coefficient of variation for Brand A.

b. Calculate the coefficient of variation for Brand B.

c. Which brand more consistently produces tablets as advertised? Explain.

Bolt Diameter		
	Machine X $\left(\frac{1}{4}"\right)$	Machine Y $\left(\frac{1}{2}"\right)$
$\bar{x}$	0.25”	0.50”
s	0.03”	0.05”

CV 12% 10%

z-Score

The ***z*-score** transforms a data value into the number of standard deviations that value is from the mean.

$$z = \frac{x - \mu}{\sigma}$$

FORMULA

$$z = \frac{\text{value} - \text{mean}\,(\mu)}{\text{St. Dev}\,(\sigma)}$$

Newborn Heights								
Baby	1	2	3	4	5	6	7	8
Inches	17.75	18.50	19.25	19.75	20.25	20.50	20.50	20.75
Centimeters	45.09	46.99	48.90	50.17	51.44	52.07	52.07	52.71

$$Z_3 = \frac{48.90 - 49}{2.25} = 0.04$$

$$Z_1 = -1.74$$

$$Z_8 = 1.65$$

$\mu = 49\text{cm}$ St Dev $= 2.25\text{cm}$