Section 2.5!

Measures of Relative Position!

PART I

Adult Female Heights (cm)

148.0*, 152.2*, 155.2*, 152.7*, 155.1*, 155.5*, 156.8*, 158.4, 158.3, 156.2*
158.6, 159.9, 164.2, 157.9, 159.8, 160.9, 162.3, 158.0, 159.8, 156.9*
162.4, 160.2, 166.9, 167.2, 167.6, 164.0, 170.4, 175.9, 176.4, 184.1

Percentile → A percentage ranking.

$$\text{The percentile of a value, } x = \frac{(\text{number of values less than } x)}{(\text{sample size})} \cdot 100 \quad (\text{Round off})$$

Ex: Compute the percentile for $x = 157.9$.

$$\text{Percentile} = \frac{9}{30} \cdot 100 = 30\text{th percentile}$$

Z-score or **Standard Score**

↳ The z-score of a value, x, is the number of standard deviations that x lies from the mean. (This is negative when x is below the mean).

→ Using Sample Data: $z = \frac{x - \bar{x}}{s}$ → Using Population Data: $z = \frac{x - \mu}{\sigma}$

Ex: Adult Female Heights. $\bar{x} = 161.39\text{cm}$, $s = 7.73\text{cm}$.

z-score of $167.6 = x$

~~$z = \frac{x - \mu}{\sigma}$~~ → $z = \frac{x - \bar{x}}{s} = \frac{167.6 - 161.39}{7.73} = 0.80$

So $x = 167.6$ is 0.80 sample std. dev's above the sample mean. → Not unusual.