

STAT PHYS SCIENCE Midterm Cheat Sheet

Noppakorn Jiravaranon

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1 Measure of Central Tendency

1.1 Mean

$$\mu = \sum \frac{x}{N} \quad (1)$$

$$\bar{x} = \sum \frac{x}{n} \quad (2)$$

1.2 Median

$$M = x_{(\frac{N+1}{2})} \quad (3)$$

2 Quantiles

2.1 Quartiles

$$Q_i = x_{(i(\frac{N-1}{4}))} \quad (4)$$

2.2 Deciles

$$D_i = x_{(i(\frac{N-1}{10}))} \quad (5)$$

2.3 Percentiles

$$P_i = x_{(i(\frac{N-1}{100}))} \quad (6)$$

3 Measurement of Variation or Dispersion

3.1 Range

$$R = x_{max} - x_{min} \quad (7)$$

3.2 Average Deviation (A.D.)

$$A.D. = \frac{\sum_{i=1}^n |x_i - \mu|}{n} \quad (8)$$

3.3 Standard Deviation (S.D.) (Population)

$$S.D. = \sigma = \sqrt{\frac{\sum_{i=1}^N (x_i - \mu)^2}{N}} = \sqrt{\frac{\sum_{i=1}^N x_i - N\mu^2}{N}} \quad (9)$$

3.4 Standard Deviation (S.D.) (Sample)

$$S.D. = s = \sqrt{\frac{\sum_{i=1}^n (x_i - \mu)^2}{n - 1}} = \sqrt{\frac{\sum_{i=1}^n x_i - N\mu^2}{n - 1}} \quad (10)$$

3.5 Quatile Deviation

$$Q.D. = \frac{Q_3 - Q_1}{2} \quad (11)$$

3.6 Skewness (Population)

$$S_k = \sum_{i=1}^N \frac{[x_i - \mu]^3}{\sigma^3 N} \quad (12)$$

if $S_k = 0$ the data is normal
else if $S_k > 0$ the data is skewed right
else if $S_k < 0$ the data is skewed left

3.7 Skewness (Sample)

$$s_k = \sum_{i=1}^N \frac{[x_i - \bar{x}]^3}{s^3 N} \quad (13)$$

if $-1 \leq s_k \leq 1$ the data is normal
else if $s_k > 1$ the data is skewed right
else if $s_k < -1$ the data is skewed left