MODULE 2 SYMBOLS & FORMULAS

Chapter 6: Central Tendency

Symbol	*Stands For*
Mo	mode
Md	median
$\bar{X}$	sample mean
Σ	"Big" sigma directs you to add up all of the values that follow
$X - \bar{X}$	deviation of a score from the mean
μ	population mean, read "mu"

$\bar{X}$ (read "ex-bar") $= \frac{\Sigma X}{N}$ or $\frac{\Sigma fX}{N}$ The first formula above tells you to add all the *X*s or scores and then to divide the result by the total number of scores (*N*).

In a frequency distribution, *N* is the sum of frequencies. The second formula above tells you to multiply each score by its frequency before summing and dividing by *N*.

Chapter 7: Dispersion and Variability

Symbol	*Stands For*
AD	average deviation
R or r	range
σ^2	population variance
s^2	sample variance
σ	population standard deviation
s	sample standard deviation
***s* approx**	an approximation of *s*; *s*-approx = R/4
SS	sum of squares or the numerator of variance
z	standard score or *z* score

FORMULAS

Formula for calculating the range

R (range) = High score - Low score

Definitional formula for calculating sample variance (an estimate of population variance)

$$s^2 = \frac{\sum (X - \bar{X})^2}{N - 1}$$

The definitional and computational formulas (below) for variance yield the exact same value. To calculate standard deviation from the definitional formal for variance, just take the square root of the entire formula after completing all other calculations indicated in the formula.

Computational formula for calculating sample variance (an estimate of population variance)

$$s^2 = \frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N - 1}$$

Computational formula for the sample variance, for a frequency distribution

$$s^2 = \frac{\Sigma fX^2 - \frac{(\Sigma fX)^2}{N}}{N - 1}$$

Computational formula for sample standard deviation (an estimate of population standard deviation)

$$s = \sqrt{\frac{\Sigma X^2 - \frac{(\Sigma X)^2}{N}}{N - 1}}$$

Computational formula for sample standard deviation for a frequency distribution

$$s = \sqrt{\frac{\Sigma fX^2 - \frac{(\Sigma fX)^2}{N}}{N-1}}$$

Formula for finding a z score from a raw score using sample statistics

$$z = \frac{X - \bar{X}}{s}$$

Formula for finding a raw score from a z score using sample statistics

$$X = zs + \bar{X}$$

Chapter 8: Probability

Symbol	*Stands For*
p(A)	probability of event
p(A or B)	probability of event A or event B
p(A, B)	probability of both A and B
p(B|A)	probability of event B given that event A has occurred

FORMULAS

Equation for the addition rule of probability

$$p(A \text{ or } B) = p(A) + p(B)$$

p(A or B) means the probability of either event A or event B, and it is equal to the probability of event A [p(A)] plus the probability of event B [p(B)].

Equation for the multiplication rule of probability

$$p(A, B) = p(A) \times p(B)$$

p(A, B) is the probability of occurrence of both event A and event B, which is equal to the product of their individual probabilities. This equation is used when events A and B are independent.

Equation for determining the probability of a sequence of nonindependent events

$$p(A, B) = p(A) \times p(B|A)$$

When events A and B are not independent—that is, when the probability of B depends on whether A has occurred—then the multiplication rule must be modified as shown. p(B|A) reads "probability of B given A."

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Some content adapted from other's work. See home page for specifics.

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Mesa Community College | 1833 W. Southern Ave. Mesa, AZ 85202 | E-mail Address: dborman@mesacc.edu | Phone: (480) 461-7181 |

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