

COMM 215 Business Statistics

List of formula provided in the Midterm Examination

Chapter 3 Describing Data Using Numerical Measures

Sample mean: $\bar{x} = \frac{\sum_{i=1}^n x_i}{n}$

Sample variance:

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1} = \frac{1}{n-1} \left[\sum x^2 - \frac{(\sum x)^2}{n} \right]$$

Sample standard deviation: $s = \sqrt{s^2}$

Z score: $z = \frac{x - \text{mean}}{\text{standard deviation}}$

Coefficient of variation: $\frac{\text{standard deviation}}{\text{mean}} \times 100 \%$

Chapter 4 Probability

The rule of complement: $P(\bar{E}) = 1 - P(E)$

The addition rule for two events:

$$P(E_1 \text{ or } E_2) = P(E_1) + P(E_2) - P(E_1 \text{ and } E_2)$$

Conditional probability: $P(E_1 | E_2) = \frac{P(E_1 \text{ and } E_2)}{P(E_2)}$

The general multiplication rule:

$$P(E_1 \text{ and } E_2) = P(E_1)P(E_2 | E_1)$$

Chapter 5 Discrete Probability Distributions

Mean (expected value) of a discrete random variable

$$E(x) = \sum xP(x)$$

Variance and standard deviation of a discrete random variable

$$\sigma_x^2 = \sum [x - E(x)]^2 P(x) \quad \sigma_x = \sqrt{\sigma_x^2}$$

Binomial probability formula

$$p(x) = \frac{n!}{x!(n-x)!} p^x q^{n-x}$$

Mean, variance, and standard deviation of a binomial random variable

$$\mu_x = np, \quad \sigma_x^2 = npq, \quad \text{and} \quad \sigma_x = \sqrt{npq}$$

Chapter 6 Continuous Probability Distributions

The normal probability curve:

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$$

Standard normal random variable: $z = \frac{x - \mu}{\sigma}$