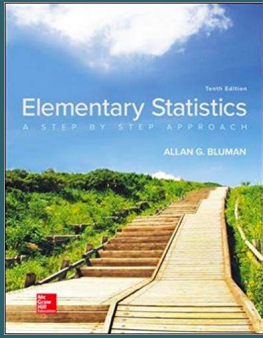


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Elementary Statistics
Revision Class

Because learning changes everything.™

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Outline of the Course

- Ch 1: The Nature of Probability and Statistics
- Ch 2: Frequency Distributions and Graphs
- Ch 3: Data Description
- Ch 4: Probability and Counting Rules
- Ch 5: Discrete Probability Distributions
- Ch 6: The Normal Distribution
- Ch 7: Confidence Intervals and Sample Size
- Ch 8: Hypothesis Testing
- Ch 9: Testing the Difference Between Two Means
- Ch 10: Correlation and Regression

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ASSESSMENT

Work	Description	Max. Points
Homework	5	100
In-class quizzes	5	100
Final Exam	Comprehensive	200
Extra Credit	Attendance and class participation	20

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The Final Exam

- This exam will be cumulative, covering information from **Chapters 1 through 10**.
- Scheduled in **Week 13** (27 May 14:00-16:00)
- You may bring a calculator, dictionary and **two sheets of A4-sized paper with handwritten** (not typed or photocopied) information on both sides.
- It will be a mixture of short Multiple-Choice Questions and a longer calculation problems.

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FINAL EXAM

Your name and signature indicate your assent to Oklahoma State's Commitment to Academic Integrity: "I will respect OSU's commitment to academic integrity and uphold the values of honesty and responsibility that preserve our academic community."

Name:

Student ID:

Signature:

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EXAMPLES

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Example

What is the value of the mode when all values in the data set are different?

- A. 0
- B. 1
- C. There is no mode
- D. It cannot be determined unless the data values are given

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Example

When data are categorized as, for example, places of residence (rural, suburban, urban), the most appropriate measure of central tendency is the

- A. mean
- B. median
- C. mode
- D. midrange

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Example

Which is not part of the five-number summary?

- A. Q1 and Q3
- B. Mean
- C. Median
- D. The minimum and maximum data values



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Example

A statistic that tells the number of standard deviations a data value is above or below the mean is called

- A. Quartile
- B. Coefficient of variation
- C. Percentile
- D. Z-score

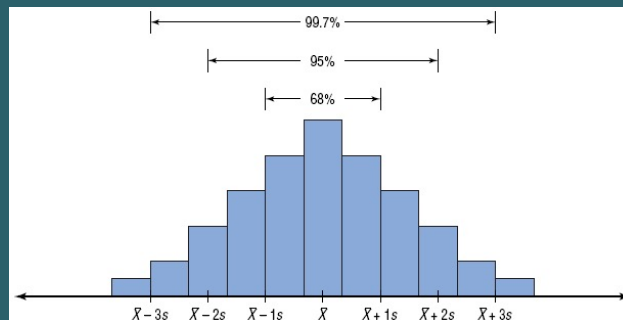
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Example

When a distribution is bell-shaped, approximately what percentage of data values will fall within 1 standard deviation of the mean?

- A. 50%
- B. 68%
- C. 95%
- D. 99.7%



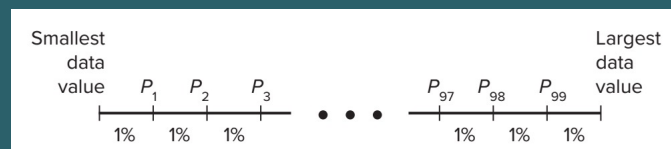
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Example

If a person's score on an exam corresponds to the 75th percentile, then that person obtained 75 correct answers out of 100 questions.

TRUE
FALSE



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Example

The probability that an event happens is 0.42. What is the probability that the event won't happen?

- A. -0.42
- B. 0.58
- C. 0
- D. 1

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Example

When a meteorologist says that there is a 30% chance of showers, what type of probability is the person using?

- A. Classical
- B. Empirical
- C. Relative
- D. Subjective

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Example

The sample space for tossing 3 coins consists of how many outcomes

- A. 2
- B. 4
- C. 6
- D. 8

HHH	HTT
HHT	THT
HTH	TTH
THH	TTT

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Example

The complement of guessing 5 correct answers on a 5-question true/false exam is

- A. Guessing 5 incorrect answers
- B. Guessing at least 1 incorrect answer
- C. Guessing at least 1 correct answer
- D. Guessing no incorrect answers

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Example

When two dice are rolled, the sample space consists of how many events?

- A. 6
- B. 12
- C. 36
- D. 54

Die 1	Die 2					
	1	2	3	4	5	6
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
4	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
5	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
6	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

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Example

The number of students taking Elementary Statistics course this semester is an example of a continuous random variable

- TRUE
- FALSE

It is a discrete random variable

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Example

How many outcomes are there in a binomial experiment?

- A. 0
- B. 1
- C. 2
- D. It varies

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Example

The number of trials for a binomial experiment

- A. Can be infinite
- B. Is unchanged
- C. Is unlimited
- D. Must be fixed

difference?

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Example

If 40% of all workers ride to work in carpools, find the probability that if 8 workers are selected, 5 will ride in carpools.

- A. 0.248
- B. 0.124
- C. 0.216
- D. 0.400

$$P(X) = \frac{n!}{(n-X)! \cdot X!} \cdot p^X \cdot q^{n-X}$$

$n=8, p=0.4, X=5$

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Example

If 80% of the applicants are able to pass a driver's proficiency road test, find the mean of the number of people who pass the test in a sample of 300 applicants

- A. 240
- B. 150
- C. 60
- D. 300

$n=300, p=0.8$

Thus, $\mu = n \cdot p = 300 \cdot 0.8 = 240$

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Example

Three out of four American adults under age 35 have eaten pizza for breakfast. If a random sample of 20 adults under age 35 is selected, find the probability that exactly 16 have eaten pizza for breakfast.

- A. 0.81
- B. 0.19
- C. 0.80
- D. 0.20

$$n = 20, p = 0.75, X = 16$$

$P(16 \text{ have eaten pizza for breakfast}) =$

$$\frac{20!}{4! 16!} (0.75)^{16} (0.25)^4 = 0.1897 \text{ or } 0.190$$

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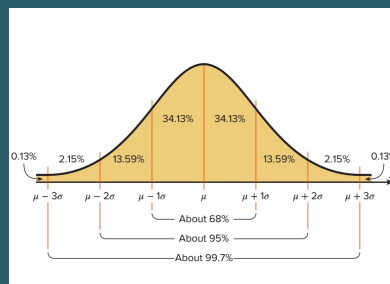
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Example

The total area under a normal distribution is infinite

TRUE

FALSE



The total area is equal to 1

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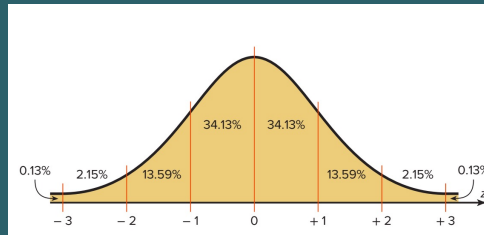
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Example

The area under the standard normal distribution to the left of $z=0$ is negative.

TRUE

FALSE



The area is positive.

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Example

Interval estimates are preferred over point estimates since a confidence level can be specified

TRUE

FALSE

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Example

An estimator is consistent if as the sample size decreases, the value of the estimator approaches the value of the parameter estimated

TRUE

FALSE

It is consistent if, as sample size **increases**, the estimator approaches the parameter being estimated.

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Example

When a 99% confidence interval is calculated instead of a 95% confidence interval with 'n' being the same, the margin of error will be

- A. Smaller
- B. Larger
- C. The same
- D. It cannot be determined

$$E = z_{\alpha/2} \left(\frac{\sigma}{\sqrt{n}} \right)$$

For a 95% confidence interval: $z_{\alpha/2} = 1.96$

For a 99% confidence interval: $z_{\alpha/2} = 2.58$

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Example

No error is committed when the null hypothesis is rejected when it is false

TRUE

FALSE

	H_0 true	H_0 false
Reject H_0	Error Type I	Correct decision
Do not reject H_0	Correct decision	Error Type II

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Example

When the value of α is increased, the probability of committing a type I error is

- A. decreased
- B. increased
- C. the same
- D. None of the above

	H_0 true	H_0 false
Reject H_0	Error Type I	Correct decision
Do not reject H_0	Correct decision	Error Type II

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Example

The degrees of freedom for the t test are

- A. n
- B. $n+1$
- C. $n-1$
- D. n^2

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Example

If the same diet is given to two groups of randomly selected individuals, the samples are considered to be dependent

TRUE

FALSE

The samples are independent

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Example

When the t test is used for testing the equality of two means, the populations must be

- A. known
- B. normal
- C. binomial
- D. very large

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Example

A negative relationship between two variables means that for the most part, as the x variable increases, the y variable increases

TRUE

FALSE

False, the y variable would decrease

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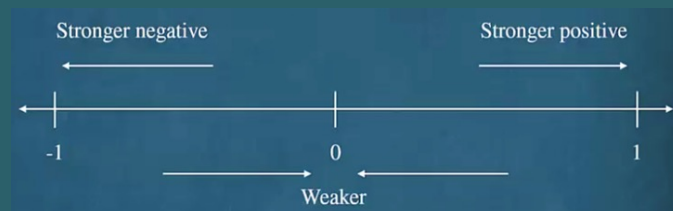
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Example

A correlation coefficient of -1 implies a perfect linear relationship between the variables

TRUE

FALSE



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Example

When the correlation coefficient is significant, you can assume x causes y

TRUE

FALSE

The relationship may be affected by another variable, or by chance

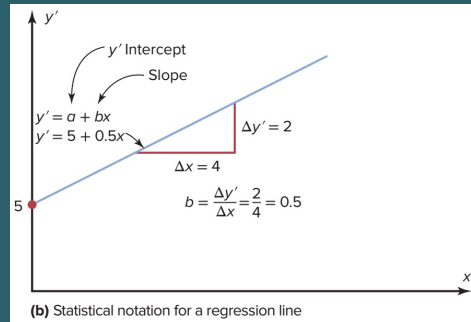
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Example

The equation of the regression line used in statistics is

- A. $x = a + by$
- B. $y = bx + a$
- C. $y' = a + bx$
- D. $x = ay + b$



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Example

The coefficient of determination is

- A. r
- B. r^2
- C. a
- D. b

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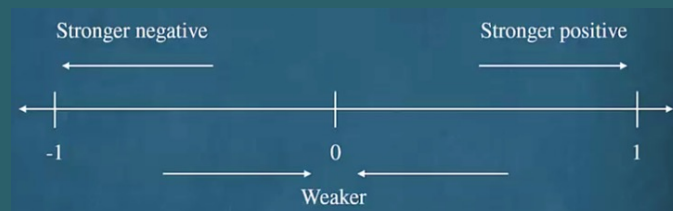
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Example

Even if the correlation coefficient is high (near +1) or low (near -1), it may not be significant

TRUE

FALSE



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Example

The number of ads on a one-hour television show is what type of data?

- A. nominal
- B. qualitative
- C. discrete
- D. continuous

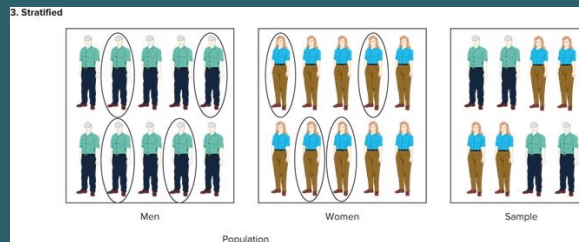
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Example

A researcher divided subjects into two groups according to gender and then selected members from each group for her sample. What sampling method was the researcher using?

- A. cluster
- B. random
- C. systematic
- D. stratified



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Example

A variable that interferes with other variables in the study is called

- A. Confounding variable
- B. Explanatory variable
- C. Outcome variable
- D. Interfering variable

Confounding variable is a variable that influences the outcome variable but cannot be separated from the other variables that influence the outcome variable (p.19)

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Questions?



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End of Revision!

Good luck!

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