

Variables and distribution questions

Business



Chapter 1. Determine whether the evaluated group is a population or a sample. Based on a randomly selected group of 500 patients with high cholesterol, it was found that 67% have heart disease. Is this a population or a sample; explain your answer.

This is a sample because a random group of 500 patients with high cholesterol is selected from all patients with high cholesterol.

2. An investigation of 150 randomly selected local restaurants concluded that 42% of local restaurants have serious health code violations. Is this a population or a sample; explain your answer.

This is a sample because a random sample of 150 local restaurants is selected from all local restaurants in the area.

3. Determine whether the given value is a statistic or a parameter.

A researcher determines that 42.7% of all downtown office buildings have ventilation problems. Is this a statistic or a parameter; explain your answer.

This is a parameter because all downtown office buildings are considered.

3. After taking the first exam, 15 of the students dropped the class. Is this a statistic or a parameter; explain your answer.

This is a parameter because 15 of the students who dropped the class are from all students who had taken the first exam.

4. Identify the type of sampling used.

A tax auditor selects every 1000th income tax return that is received. What type of sample is this and why?

This is a Systematic sample because every 1000th tax return is selected from the list of income tax return.

5. The name of each contestant is written on a separate card, and the cards are placed in a bag with three names being picked from the bag. What type

of sample is this and why?

This is a Simple Random sample because cards are randomly drawn and each contestant has equal chance of being selected.

6. Is the study experimental or observation and why?

A political pollster reports that his candidate has a 10% lead in the polls with 10% undecided. Select the study that is most appropriate and EXPLAIN WHY it is most appropriate for the study.

This is an Observational study because this is observation (measurement) from political pollster without influencing candidates.

7. Is the aspirin produced by a particular pharmaceutical company better than that of a competitor at relieving headaches? Which of the following would best be used to study this: 1) a case-controlled observation; 2) an observation; 3) a double-blind experimental procedure; and 4) and experimental procedure.

A double-blind experimental procedure would be best used to study this because the identities of the product (Aspirin and competitor equivalent brand) should be concealed. Further, using this type of study, subjective bias on the part of both experimental subjects and the experimenters would be eliminated.

Chapter Two

1. Identify the following variables as either qualitative or quantitative and EXPLAIN your answers.

The number of people on a jury.

Quantitative, as jury members can be counted.

The color of your house.

Qualitative, as color of the house is described by word (or category) rather

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than number.

2. Identify the number as either continuous or discrete and EXPLAIN your answers.

The average height of all freshmen entering college in a certain year is 68.4 inches.

Continuous, as average height is a physical measurement and can have any value within an interval that contains infinitely many possible values.

The number of limbs on a 2-year-old oak tree is 21.

Discrete, as the number of limbs on a 2-year-old oak tree can be counted.

Determine which of the four levels of measurement is most appropriate and explain your answer.

Temperatures in degrees Fahrenheit of the ocean at various depths.

Interval, as distance has meaning. The interval between 50°F and 60°F is the same as the interval between 10°F and 20°F. Further, the zero point of these scales is arbitrary, we can't say that 40°F is twice as warm as 20°F, or that 60°F is 50 percent warmer than 40°F.

The rank of individuals in the military.

Ordinal, as rank has meaning and can be ordered from high to low or low to high.

The number of people with blue, brown and red hair in a classroom.

Ratio, as meaningful zero exists that is the absence of quantity being measured. There is always a possibility that no people with blue, brown and red hair in a classroom.

3. Determine the following (show your work):

The speed of a new microprocessor is 800MHZ, but a new test of its speed gives a measurement of 820MHZ. What is the absolute error? What is the

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relative error?

Absolute error = measured value - actual value = $820 - 800 = 20\text{MHZ}$

Relative error =

Convert $1/16$ to a percent

$1/16 = 0.0625 = (0.0625) \cdot 100\% = 6.25\%$

Convert 0.45 to a percent

$0.45 = 0.45 \cdot 100\% = 45\%$

4. Humanities majors spend an average of \$115 per course on books.

Mathematics majors spend an average of \$70 per course on books.

What is the percent difference between the two amounts relative to the amount for mathematics majors (round to the nearest percent)?

Relative difference =

The percent difference between the two amounts relative to the amount for mathematics majors is about 64%.

Suppose that the cost of a statistics text was \$50 in 1985 and is \$100 in 2000.

5. What is the “ Statistics Text Index” number, rounded to the nearest tenth, for the 2000 edition with the 1985 price as the reference value?

Statistics Text Index =

The “ Statistics Text Index” number for the 2000 edition with the 1985 price as the reference value is 200.