Homework #1

MATH 150

Due: Jan 19, 2024

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Problem 1

In each of the following parts, identify the sample and sample size. What is the population of interest?

(a) In a survey of 200 iPhone users in the United States, 4% say that their screen has one or more cracks in it.

(b) A large electronics retailer sends satisfaction surveys to everyone that purchases one of their flat-screen TVs. Last year, 1523 of their 21,044 customers responded.

(c) Scientists studying the effects of a new antidepressant conduct a trial with 87 adolescents between the ages of 11 and 15. Of these, 43% report a reduction in symptoms.

Answer

(a)

1. Population: every owned iPhone user in the United States.

2. Sample: the 200 iPhones.

3. Sample size: 200 (Assuming all 200 responded).

(b)

1. Population: everyone who bought a flat-screen TV last year.

2. Sample: everyone who bought a flat-screen TV from this specific electronic retailer (because the survey was sent to EVERYONE, so its all of the retailer's costumers).

3. Sample size: 1523 (people who actually gave us data).

(c)

1. Population: all adolescents between the ages 11 and 15.

2. Sample: the adolescents who took part in the study.

3. Sample size: 87.

Problem 2

Determine whether the numerical value given is a parameter or statistic. Explain your answer in just a sentence or two.

(a) In a recent year, the average salary of a company's 12 vice-presidents was \$475,775.

(b) In a survey of 1222 Illinois residents, 82% reported dissatisfaction with their state government.

(c) Official records show that 61% of all voters in a certain township voted in the last election.

Answer

(a)

1. Parameter: the average salary of all the company vice presidents. (The sample is the average salary of the 12, but as parameter describes the population, it would be EVERY vice president in a company.)

2. Statistic: 475,775. (In contrast to parameter which describes the population, statistic describes that specific sample in question, therefore the statistic will be the average salary of the 12 vice presidents looked upon.)

(b)

1. Parameter: the satisfaction/dissatisfaction rate of all the Illinois residents toward their state government. (this argument is reporting the satisfaction/dissatisfaction rate, but as the population in interest are all Illinois residents and not only the sample, parameter will be calculated with respect to population.)

2. Statistic: %82. (Because statistic is in respect to sample, it will show the result in respect to the 1222 people, which is a %82 satisfaction/dissatisfaction rate.)

(c)

1. Parameter: %61. (the percentage is derived from an analysis of population, not sample [ALL VOTERS], therefore it is the parameter.

2. Statistic: this statement does not have a statistic as it does not specifically use a sample (sample must be smaller in size than the population), therefore this statement does not have any statistics. (If for example the statement included a phrase like the following, it would've had a sample, and therefore statistic: "From the town's 500 voters who filled the questionnaire, %61 said they voted in the last election." In that case %61 would've been the statistics.)