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Algebra 2 Unit 8 Confidence Intervals

SHOW ALL WORK on the worksheet

1. In a random sample of 550 boxes, 52% weighed more than 10 pounds. Give the interval that is likely to contain the exact percent that weighed over 10 pounds.

2. A Gallup Survey reported that 23% of students surveyed, or 181 students, say that math is their favorite subject in school. How many students were surveyed? Give an interval that is likely to contain the exact percent of all students who would say that math is their favorite subject.

3. Find the sample size that is needed for the margin of error to be ±1.5%

4. In a survey of high school students, 13% said that they play basketball regularly. The margin of error is ±4%. A student showed the following work to calculate the sample size:
$$0.13 = \frac{1}{\sqrt{n}}$$
$$0.0169 = \frac{1}{n}$$
$$n \approx 59$$
Did the student find the correct sample size? If not, explain what the student did incorrectly and find the correct sample size.

5. A survey reported that 235 out of 500 voters in a sample voted for candidate A and the remainder voted for candidate B. Find an interval that is likely to contain the exact percent of all voters who voted for each candidate. Based on these intervals, can you be confident that candidate B won?

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6. In a survey of 1011 people, 52% said that the internet is their main source of news. Find an interval that is likely to contain the exact percent of the population that use the internet as their main source of news.

7. A survey of 517 teenagers found that 34% said that their favorite way to spend an evening was to hang out with family or friends. What is the interval that likely contains the exact percent of the population that enjoy spending an evening hanging out with family or friends?

8. The time spent by shoppers in a supermarket is normally distributed with a mean of 45 minutes and a standard deviation of 12 minutes. What percent of shoppers spend between 45 and 69 minutes shopping?

Use the data set for problems 9 – 11: 41, 38, 42, 41, 45, 44, 48, 35
9. Find the mean, median, mode, range and standard deviation of the data

10. Find the mean, median, mode, range and standard deviation if each value is tripled

11. Find the mean, median, mode, range and standard deviation is 5 is subtracted from each value in the given data set.

Algebra 2 Unit 8 Confidence Intervals KEY

1. 47.7% to 56.3%

2. 787 students; 19.4% to 26.6%

3. 4444

4. The student needed to use 0.04 instead of 0.13. The sample size is 625

5. Candidate A: 42.5% to 51.5%
   Candidate B: 48.5% to 57.5%
   Since the intervals overlap, it is not certain that candidate B won the election.

6. 48.9% to 55.1%

7. 29.6% to 38.4%

8. 47.5%

9. $\bar{x} = 41.75$
   Median = 41.5
   Mode = 41
   Range = 13
   $\sigma \approx 3.8$

10. $\bar{x} = 125.25$
    Median = 124.5
    Mode = 123
    Range = 39
    $\sigma \approx 11.4$

11. $\bar{x} = 36.75$
    Median = 36.5
    Mode = 36
    Range = 13
    $\sigma \approx 3.8$