Unit 8 Review - Statistics NAME Key

Observational Study vs Experiment
Classify each as either an observational study or an experiment.

1. You want to determine the number of strikes thrown by a pitcher in a baseball game out of 100 pitches.

observational

2. You want to test the effectiveness of a new medicine in lowering blood pressure. You randomly select a group to take a sugar pill (unknown to the patients) and you randomly select a group to take the new medicine.

experiment

3. You want to determine the number of cars driving through the intersection of Richmond Road and Chardon Road during rush hour.

observational

Sampling Techniques
Categorize each technique as simple random, stratified, systematic, cluster, convenience, or voluntary response.

4. For a contest, participants are asked to write their information on a business card and place it in a bin. Three names will be randomly selected from the bin.

simple random

5. In order to determine the favorite unit that was taught this semester in Math 3, Miss Grimm surveys her three Math 3 classes.

convenience

6. At an athletics conference, 5 members from each of the seven different sports teams were asked what they valued in a captain.

Stratified

7. At the grocery store, every eighteenth customer earned 20% off of their groceries.

systematic

8. Homeroom classes were surveyed to determine what would be favorite activity to include at an end of the year party. The principal selected seven out of the thirteen classrooms and surveyed all of the students in those seven classrooms.

cluster

9. In order to determine how many caffeinated drinks college students are consuming, statisticians stood outside of the cafeteria and asked willing participants as they entered the building.

voluntary response

Population and Parameter vs Sample and Statistic
Determine the population, sample, parameter, and statistic.

10. On any given day, approximately 4500 people visit the zoo. On one extremely hot day, you are curious to know how many people purchased water at the zoo. Out of the 1,200 people you surveyed that day, 755 had purchased water.

Pop: 4500 zoo visitors Sample: 1200 surveyed
Parameter: actual % of water purchases Stat: 63% who bought water

11. A survey of 2863 American households found that 74% of the households own a pet.

Pop: All households Sample: 2863 surveyed
Parameter: actual % pet owners Stat: 74% pet owners

Types of Bias
Identify which kinds of bias is in each of the following scenarios.

12. A police officer asks citizens if they have even stolen from a store.

response

13. A principal at a high school asks the freshman class to vote for the school's Teacher of the Year.

undercoverage

14. A survey asks the question: "Are you in favor of using pesticides on crops, even though they are horrible on the environment?"

question wording

15. An Instagram poll asks the question, "Do you hear Yanny or Laurel?"

voluntary response

Margin of Error

16. A poll reports that 58% of the voters prefer Candidate B with a margin of error of ± 3%. Estimate the number of voters in the poll.

≈ 1111 voters polled

17. It is estimated that 80% of all seniors in high school complete their homework every night (margin of error ± 3.5%). Determine the interval likely to contain the exact percentage.

76.5% – 83.5%

18. Determine the margin of error for a sample size of 1700.

± 0.024

Then determine the sample size you would have to use to cut the margin of error in half.

6800

Simulations

19. You take a quiz with 6 questions. After you study, you estimate that you would have about an 80% chance of getting any individual question right.

1 – 80 = question correct 81 – 100 = question wrong

Trial #	Numbers
1	63, 89, 13, 46, 47, 29
2	82, 99, 50, 41, 23, 63
3	62, 81, 78, 47, 93, 63
4	34, 46, 81, 87, 26, 72
5	47, 48, 22, 10, 37, 18
6	93, 84, 26, 73, 25, 11
7	74, 23, 60, 82, 94, 50
8	10, 41, 65, 36, 82, 73
9	3, 39, 37, 24, 19, 24
10	79, 46, 34, 72, 95, 73
11	14, 38, 57, 59, 34, 23
12	28, 90, 20, 53, 33, 71
13	97, 93, 65, 70, 2, 74
14	98, 32, 51, 41, 24, 11
15	63, 23, 56, 27, 74, 36

19. Determine the probability of getting all of the questions correct.

27%.

20. Determine the probability of getting at least four questions correct.

100%.

21. Determine the probability of getting exactly one question wrong.

33%.

22. Determine the probability of getting the first question correct.

73%.

23. Determine the probability of getting the last question wrong.

0%.

20. When a woman is pregnant, she has an equal chance of having a boy or a girl. A woman has three children.

1 = boy 2 = girl

Trial #	Numbers
1	2, 1, 2
2	1, 1, 2
3	1, 2, 1
4	1, 1, 1
5	1, 1, 1
6	2, 1, 1
7	1, 1, 2
8	2, 1, 2
9	1, 2, 2
10	1, 2, 1
11	1, 2, 1
12	1, 2, 1
13	1, 2, 1
14	2, 2, 2
15	2, 2, 1
16	1, 1, 1
17	1, 2, 2
18	2, 1, 2

23. Determine the probability of having all boys.

17%.

24. Determine the probability of having all girls.

6%.

25. Determine the probability of having only one girl.

44%.

26. Determine the probability that the oldest child is a boy.

67%.