

Name Key Period: _____ Date _____

Chapter 11 Review Worksheet

1. A normal distribution has mean μ and standard deviation σ . Find the indicated probability for a randomly selected x -value from the distribution. For each part, draw a normal curve, label the axis and shade the appropriate region(s).

a. $P(x \geq \mu - 2\sigma)$

0.975

b. $P(\mu - \sigma \leq x \leq \mu + 3\sigma)$

0.8385

2. A normal distribution has a mean of 122 and a standard deviation of 6. Find the probability that a randomly selected x -value from the distribution is in the given interval. For each part, draw a normal curve, label the axis and shade the appropriate region(s).

- a. between 110 and 128

0.815

- b. at most 122

0.5

- c. at least 104

0.9985

- d. greater than 134

0.025

3. The 40-yard dash times for all football players in the United States are normally distributed with a mean of 5.3 seconds and a standard deviation of 0.3 second. Are these numerical values parameters or statistics?

Parameters

4. A pitcher throws 40 fastballs a game. A baseball analyst records the speeds of 10 fastballs and finds the mean speed is 92.4 miles/hour. Is the mean speed a parameter or a statistic? **Explain.**

Statistic; only 10 of the 40 fastballs were included.

5. To estimate the average number of miles driven by U.S. motorists each year, a researcher conducts a survey of 1000 drivers, records the number of miles they drive in a year, and then determines the average. Identify the population and the sample.

Population: all U.S. drivers

Sample: 1000 U.S. drivers who were surveyed

6. An amusement park wants to know whether more teenagers or adults ride a particular roller coaster. Is this research topic best investigated through an experiment or an observational study?

Observational study.

7. Match each description (a-e) with the correct sampling method (A-E). A researcher is doing a study at Cal High and wants to choose a sample of 400 students to survey. The researcher:

E a. Selects every 7th student in the school directory.

C b. Emails a survey to all students asking them to fill out an online survey and takes the first 400 who respond.

D c. Randomly selects 100 students from each grade.

B d. Stands outside the main building doors when lunch period starts and selects the first 400 students who come out.

A e. Divides the student population into groups of 100 students and randomly selects four groups to survey.

A. Cluster B. Convenience C. Self-selected D. Stratified E. Systematic

8. In a recent survey of 2200 randomly selected U.S. teenagers, 92% said they had a cell phone.

- a. Identify the population and the sample.

Population: all U.S. teenagers

Sample: 2200 U.S. teens who were surveyed

- b. Find the margin of error for the survey.

$\pm 2.1\%$

- c. Give an interval that is likely to contain the exact percent of all U.S. teenagers who have a cell phone.

89.9% to 94.1%

9. A Memorial Day 5K race is run for charity each year. The mean time that it takes the runners to complete the course is 38 minutes with a standard deviation of 6 minutes. The race has 720 people registered to run this year. Use the standard normal table below to answer the following questions.

a. Calculate the percent of runners predicted to finish the race in 42 minutes or less.

75.8%

b. Calculate the percent of runners predicted to take longer than 55 minutes to finish the race.

0.26%

c. Calculate the approximate number of runners predicted to finish in less than 29 minutes.

48 runners

Standard Normal Table										
z	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
-3	.0013	.0010	.0007	.0005	.0003	.0002	.0002	.0001	.0001	.0000+
-2	.0228	.0179	.0139	.0107	.0082	.0062	.0047	.0035	.0026	.0019
-1	.1587	.1357	.1151	.0968	.0808	.0668	.0548	.0446	.0359	.0287
-0	.5000	.4602	.4207	.3821	.3446	.3085	.2743	.2420	.2119	.1841
0	.5000	.5398	.5793	.6179	.6554	.6915	.7257	.7580	.7881	.8159
1	.8413	.8643	.8849	.9032	.9192	.9332	.9452	.9554	.9641	.9713
2	.9772	.9821	.9861	.9893	.9918	.9938	.9953	.9965	.9974	.9981
3	.9987	.9990	.9993	.9995	.9997	.9998	.9998	.9999	.9999	1.0000-