

1) Find the area under the standard normal curve that lies

(ii) draw a normal curve and shade the correct answer

(a) between $z = 0$ and $z = 2.58$

(b) to the left of $z = 1.96$

(c) to the right of $z = -1.25$

Find z if:

(a) the normal-curve area between 0 and z is 0.1915

(b) the normal-curve area to the right of z is 0.8665

A CPA is examining the records of a business. The business has 74 major accounts and the CPA decides to audit a random sample of 8 of the accounts. Describe how this can be done.

A CPA is examining the records of a business. The business has 74 major accounts and the CPA decides to audit a random sample of 8 of the accounts. Now using the 16th and 17th columns and starting on the 6th row - list the 8 firms selected.

Now using the 16, 17th columns and the 6th row list the 8 firms selected

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

3) A random variable has a normal distribution with the standard deviation $\sigma = 10$. Find its mean if the probability is 0.8264 that it will take on a value less than 77.5.

4) The annual number of tornadoes in a certain state is a random variable with $\mu = 28.2$ and $\sigma = 5.1$. Approximating the distribution of this random variable with a normal distribution, find the probability that there will be at least 24 tornadoes in the state in any given year.

5) A dating service finds that 15% of the couples that it matches eventually get married. In the next 50 matches that the service makes, find the probabilities that:

(a) at least 6 couples marry

(b) at most 10 couples marry.

6) A normal curve with mean = ~~30~~²⁵ has an area of .3531 between 25 and 34. What is the standard deviation? (100 cc)

7) According to the U.S. Bureau of Justice, 0.24% of the population of the United States in 1992 were full-time sworn police officers of state and local governments. Use the Poisson approximation to the binomial distribution to determine the probability that in a random sample of 2,000 inhabitants of the United States 4 or 5 were full-time sworn police officers of state and local governments in 1992.

8)

A box contains 6 red balls, 3 white balls, and 4 blue balls. A ball is selected at random from the box, its color noted, then replaced. Find the probability that out of 6 balls selected in this manner we will get 3 red 2 white and 1 blue.

(B) Calculate the probability for part A if the balls are not replaced

9)

A collection of eight Spanish gold doubloons contains five counterfeits. If two of these coins are randomly selected to be sold at auction, what are the probabilities that

- (a) neither coin is a counterfeit;
- (b) either or both coins are counterfeits?

10)

According to the Mendelian theory of heredity, if plants with round yellow seeds are crossbred with plants with wrinkled green seeds, the probabilities of getting a plant that produces round yellow seeds, wrinkled yellow seeds, round green seeds, or wrinkled green seeds are, respectively, $\frac{9}{16}$, $\frac{3}{16}$, $\frac{3}{16}$, and $\frac{1}{16}$. What is the probability that among nine plants thus obtained there will be four that produce round yellow seeds, two that produce wrinkled yellow seeds, three that produce round green seeds, and none that produce wrinkled green seeds?

11

Which of the following distributions is continuous?

Circle your ans

- a. normal distribution
- b. multinomial distribution
- c. binomial distribution
- d. hypergeometric distribution

2) A newspaper advertisement for *USA Today: The Television Show* said:

Should handgun control be tougher? You call the shots in a special call-in poll tonight. If yes, call 1-900-720-6181. If no, call 1-900-720-6182.

Charge is 50 cents for the first minute.

Explain why this opinion poll is almost certainly biased.

13) Identify the type of sampling:

Chosen at random, 200 rural and 200 urban persons age 65 or older were asked about their health and experience with prescription drugs.

For quality assurance, every twelfth engine part is selected from an assembly line and tested for durability.

Consider this question taken from CNN Quick Vote on the Internet on 7/24/98: In this last season of *Seinfeld*, should Jerry Seinfeld have been nominated for an Emmy? The response was 34% yes, 66% no.

What body of the federal government illustrates a stratified sampling of the people? (A random selection process is not used.)

8) b

What body of the federal government illustrates a proportional sampling of the people? (A random selection process is not used.)

20
11

Among 80 persons interviewed for certain jobs by a government agency, 40 are married, 20 are single, 10 are divorced, and 10 are widowed. In how many ways can a 10 percent stratified sample be chosen from among the persons interviewed if

- (a) one-fourth of the sample is to be allocated to each group;
- (b) the allocation is proportional?

- 15) Determine whether the following can be a probability distribution (defined only for the given values of x), and explain your answers:

$$a) f(x) = \frac{x+1}{14} \quad x=1,2,3,4$$

$$b) f(x) = \frac{x+4}{x-4} \quad x=1,2,3,4,5$$

- 16) Suppose that the probabilities are 0.4, 0.3, 0.2, and 0.1 that 0, 1, 2, or 3 hurricanes will hit a certain coast area in any given year.

a) Find the mean of this probability distribution.

b) Find the variance of this probability distribution.

17) During the last week of the semester, students at a certain college spend on the average 4.3 hours using the school's computer terminals with a standard deviation of 1.8 hours. For a random sample of 36 students at that college, find the probabilities that the average time spent using the computer terminals during the last week of the semester is

a) at least 4.8 hours;

b) between 4.1 and 4.5 hours.

Bonus

~~18)~~
~~(18)~~ If the mean of a random sample of size 81 is used to estimate the mean of an infinite population with $\sigma = 18$, what is the probability that the error is less than 3, based on the central limit theorem?

~~21)~~
~~(21)~~ If the mean operating life for a particular make of a washing machine is $N = 10.5$ years with a standard deviation of $\sigma = 2.2$ years, then the probability that the mean operating life for a sample of 64 of these washing machines is less than 10 years is:

~~20)~~
~~(20)~~ The allowable amount of nitrates in drinking water is 5 ppm (parts per million). To test the drinking water from a certain well, 50 samples of water are taken and the amount of nitrates measured. If the mean amount of nitrates per water sample is actually 6 ppm with a standard deviation of 3, what is the probability that the mean amount of nitrates from a sample of 50 water samples will be less than 5ppm?