

Stat C1000 Exam 2 Practice.

Show all calculations when appropriate. This is not homework; do not turn in.

1. Given the distribution that:

x	P(x)
0	0.09
1	0.15
2	0.23
3	0.36
4	0.17

- List ALL the conditions that shown above is a probability distribution. (2 pts)
- Find the mean of the probability distribution. (3 pts)
- Find the standard deviation. (3 pts)

2. A 40-year-old man in the U.S. has a 0.242% risk of dying during the next year. An insurance company charges \$275 for a life-insurance policy that pays a \$100,000 death benefit. What is the expected value for the person buying the insurance? (4 pts)

3. An insurance company estimates the probability of an earthquake in the next year to be 0.0013. The average damage done by an earthquake it estimates to be \$60,000. If the company offers earthquake insurance for \$100, what is their expected value of the policy? (4 pts)

4. A tennis player makes a succesful serve 51% of the time. If she serves 9 times, what is the probability that she gets exactly 3 successful first serves in? Assume that each serve is independent of the others. (4 pts)

5. A test consists of 10 true/false questions. To pass the test a student must answer at least six questions correctly. If a student guesses on each question, what is the probability that the student will pass the test? (4 pts)

6. McDonald's has a 95% recognition rate. A focus group consists of 12 randomly selected adults. Find the minimum usual number of people who would recognize McDonald's. (4 pts)

7. On average, a clothing store gets 120 customers per day; the store is open 12 hours each day.

- Find the probability of getting 150 customers in one day. (4 pts)
- Find the probability of getting 35 customers in the first four hours. (4 pts)
- Find the probability that the store will have more than 12 customers in the first hour. (4 pts)

8. Find the following probabilities assuming a standard normal distribution: (3 pts each)

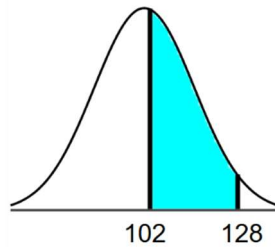
- $P(-2.05 < z < 1.25)$
 - $P(z > 2.33)$
9. Find the **value of a** (z-score) such that: (3 pts each)
- $P(z > a) = 0.65$
 - $P(-a < z < a) = 0.90$

10. The birth weights of U.S. babies have a normal distribution with a mean of 7.2 pounds and standard deviation of 1.3 pounds.

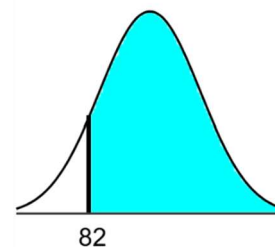
- Find the probability that a baby chosen at random weighs less than 9 lbs. (4 pts)
- Find the weight of a baby chosen at random would weigh more than 80% of the all other babies. (4 pts)

11. There is a 25% chance that a student at SRJC is left-handed. A sample of 200 students is randomly selected. Find the probability that less than 70 students are left-handed. (4 pts)

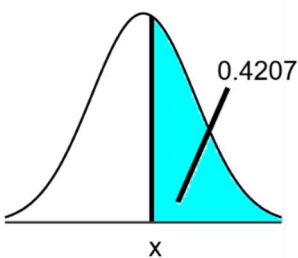
12. The graph depicts IQ scores of adults, and those scores are normally distributed with a mean of 100 and a standard deviation of 15. Find the area of the shaded region. (4 pts)



13. Find the area of the shaded region. The graph to the right depicts IQ scores of adults, and those scores are normally distributed with a mean of 100 and a standard deviation of 15. (4 pts)



14. The graph below depicts IQ scores of adults, and those scores are normally distributed with a mean of 100 and a standard deviation of 15. Find the indicated IQ score. (4 pts)



15. Given that the overhead reach distances of adult females: $\mu = 205.5$ cm, $\sigma = 8.6$ cm, and overhead reach distances are normally distributed. The overhead reach distances are used in planning assembly work stations.

a. If 1 adult female is randomly selected, find the probability that her overhead reach is between 179.7 cm and 231.3 cm. (4 pts)

b. If 40 adult females are randomly selected, find the probability that they have a mean overhead reach between 204.0 cm and 206.0 cm. (4 pts)

16. Assume that females have pulse rates that are normally distributed with a mean of 76.0 beats per minute and a standard deviation of 12.5 beats per minute. If 25 adult females are randomly selected, find the probability that they have pulse rates with a mean less than 79 beats per minute. (4 pts)

Keys:

1. a. The 3 conditions stated in class; b. $\mu = 2.37$; c. $\sigma = 1.19$
2. $-\$33$
3. $-\$22$
4. 0.154
5. 0.377
6. 9.9 people
7. a. 0.001; b. 0.049; c. 0.208
8. a. 0.874; b. 0.0099
9. a. $a = -0.385$; b. $a = 1.645$
10. a. 0.92; b. 8.29
11. 0.999
12. 0.416
13. 0.885
14. 103
15. a. 0.997; b. 0.509
16. 0.885