

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the mean for the given sample data.

- 1) Bill kept track of the number of hours he spent exercising each week. The results for four months are shown below. Find the mean number of hours Bill spent exercising per week. Round your answer to two decimal places. 1) _____
- 7.40 8.20 8.90 7.80 7.60 7.40
8.00 8.90 8.20 7.40 7.80 8.10
6.70 8.20 8.20 7.80 7.60 8.00
- A) 8.36 B) 8.13 C) 7.90 D) 7.48

Find the median for the given sample data.

- 2) A store manager kept track of the number of newspapers sold each week over a seven-week period. The results are shown below. 2) _____
- 65, 35, 214, 144, 255, 247, 240
- Find the median number of newspapers sold.
- A) 214 newspapers B) 144 newspapers C) 171 newspapers D) 240 newspapers

Solve the problem.

- 3) The quadratic mean (or root mean square) is usually used in physical applications. In power distribution systems, for example, voltages and currents are usually referred to in terms of their root mean square value. The quadratic mean of a set of values is obtained by squaring each value, adding the results, dividing by the number of values (n), and then taking the square root of that result, expressed as 3) _____

$$\text{quadratic mean} = \sqrt{\frac{\sum x^2}{n}}$$

Find the root mean square of these power supplies (in volts): 63, 1, 91, 108.

- A) 77.3 volts B) 131.5 volts C) 38.7 volts D) 65.8 volts

Find the range for the given data.

- 4) The manager of an electrical supply store measured the diameters of the rolls of wire in the inventory. The diameters of the rolls (in m) are listed below. 4) _____
- 0.188 0.114 0.529 0.417 0.598 0.304
- Compute the range.
- A) 0.484 B) 0.116 C) 0.114 D) 0.529

Find the standard deviation for the given data. Round your answer to one more decimal place than the original data.

- 5) 496, 598, 503, 528, 565, 601, 576, 543 5) _____
- A) 170.2 B) 40.4 C) 60.6 D) 182.1

Find the indicated probability.

- 12) Two 6-sided dice are rolled. What is the probability that the sum of the two numbers on the dice will be 5? 12) _____
- A) $\frac{8}{9}$ B) $\frac{1}{9}$ C) 4 D) $\frac{5}{6}$

Answer the question, considering an event to be "unusual" if its probability is less than or equal to 0.05.

- 13) If you are told that a mystery person's name begins with a consonant, would it be "unusual" to guess the first letter of that person's name? 13) _____
- A) No B) Yes

Solve the problem.

- 14) A consumer organization estimates that 30% of the households in a particular community have one television set, 38% have two sets, and 20% have three or more sets. What is the probability that a household chosen at random has no television sets? 14) _____
- A) 0.12 B) 0.16 C) 0 D) 0.88 E) 0.18

Solve the problem. Round your answer, as needed.

- 15) A study conducted at a certain college shows that 75% of the school's graduates find a job in their chosen field within a year after graduation. Find the probability that 5 randomly selected graduates all find jobs in their chosen field within a year of graduating. 15) _____
- A) 0.3750 B) 0.2373 C) 3.7500 D) 0.0667

Determine whether the events are disjoint, independent, neither, or both.

- 16) In rolling a fair die twice, the events of getting a 2 on the first roll and a 4 on the second 16) _____
- A) Disjoint B) Independent C) Neither D) Both

List the sample space and tell whether the events are equally likely.

- 17) Roll a die eight times; record the length of the longest run of sixes. 17) _____
- A) {1, 2, 3, 4, 5, 6, 7, 8}, not equally likely
B) {1, 2, 3, 4, 5, 6}, equally likely
C) {0, 1, 2, 3, 4, 5, 6, 7, 8}, equally likely
D) {0, 1, 2, 3, 4, 5, 6}, not equally likely
E) {0, 1, 2, 3, 4, 5, 6, 7, 8}, not equally likely

Solve the problem.

- 18) The probability that a student at a certain college is male is 0.45. The probability that a student at that college has a job off campus is 0.33. The probability that a student at the college is male and has a job off campus is 0.15. If a student is chosen at random from the college, what is the probability that the student is male or has an off campus job? 18) _____
- A) 0 B) 0.93 C) 0.47 D) 0.63 E) 0.78

Find the indicated probability.

- 19) The contingency table below provides a joint frequency distribution for a random sample of patients at a hospital classified by blood type and sex. 19) _____

		Blood Type				Total
		O	A	B	AB	
Sex	F	97	96	23	9	225
	M	78	67	14	6	165
Total		175	163	37	15	390

If a person is selected at random from the sample, find the probability that the person has blood type A and is female.

- A) 0.246 B) 0.995 C) 0.749 D) 0.427 E) 0.589
- 20) The contingency table below provides a joint frequency distribution for a random sample of patients at a hospital classified by blood type and sex. 20) _____

		Blood Type				Total
		O	A	B	AB	
Sex	F	103	86	25	11	225
	M	74	71	14	6	165
Total		177	157	39	17	390

If a person is selected at random from the sample, find the probability that the person has blood type A or is female.

- A) 0.759 B) 0.382 C) 0.548 D) 0.221 E) 0.979
- 21) You draw a card at random from a standard deck of 52 cards. Find the probability that the card is a spade given that it is not a diamond. 21) _____
- A) 0.333 B) 0 C) 0.077 D) 0.25 E) 0.5

- 22) The table below describes the smoking habits of a group of asthma sufferers. 22) _____

	Light Heavy			Total
	Nonsmoker	smoker	smoker	
Men	395	63	79	537
Women	363	86	67	516
Total	758	149	146	1053

What is the probability that a woman is a nonsmoker?

- A) 0.720 B) 0.49 C) 0.703 D) 0.479 E) 0.345

- 23) You are dealt a hand of three cards, one at a time. Find the probability that your third card is your first ace. 23) _____
 A) 0.077 B) 0.127 C) 0.145 D) 0.068 E) 0.00018
- 24) You are dealt a hand of three cards, one at a time. Find the probability that you have at least one queen. 24) _____
 A) 0.204 B) 0.068 C) 0.217 D) 0.783 E) 0.213

Determine whether the events are independent and give a reason.

- 25) The table shows the political affiliation of voters in one city and their positions on stronger gun control laws. 25) _____

	Stronger Gun Control	
	Favor	Oppose
Republican	0.08	0.33
Democrat	0.22	0.2
Other	0.13	0.04

Are party affiliation and position on gun control laws independent? Explain.

- A) No;
 $P(\text{Democrat and Favor}) = 0.22$
 $P(\text{Republican and Favor}) = 0.08$
 These are not equal
- B) Yes; a voter who favors stronger gun control laws cannot be both a Democrat and a Republican
- C) No; 52.4% of Democrats favor stronger gun control laws, but only 19.5% of Republicans favor them
- D) No; 8% of voters both favor stronger gun control laws and are Republicans
- E) Yes;
 52.4% of Democrats favor stronger gun control laws and
 52.4% of Republicans favor stronger gun control laws

Find the expected value of the random variable.

- 26) The probabilities that a batch of 4 computers will contain 0, 1, 2, 3, and 4 defective computers are 0.4096, 0.4096, 0.1536, 0.0256, and 0.0016, respectively. Find the expected number of defective computers in a batch of 4. 26) _____
 A) 0.80 B) 1.21 C) 2.00 D) 0.70 E) 0.89
- 27) A contractor is considering a sale that promises a profit of \$28,000 with a probability of 0.7 or a loss (due to bad weather, strikes, and such) of \$4000 with a probability of 0.3. What is the expected profit? 27) _____
 A) \$18,400 B) \$20,800 C) \$22,400 D) \$24,000 E) \$19,600

Find the indicated probability.

- 28) A tennis player makes a successful first serve 59% of the time. If she serves 7 times, what is the probability that she gets exactly 3 first serves in? Assume that each serve is independent of the others. 28) _____
 A) 0.0847 B) 0.2031 C) 0.0058 D) 0.7969 E) 0.2054

Find the probability of the outcome described.

- 29) A beginning archer is able to hit the bull's-eye 39% of the time. If she shoots 9 arrows, what is the probability that she gets at most 3 bull's-eyes? Assume each shot is independent of the others. 29) _____
A) 0.4922 B) 0.0270 C) 0.2511 D) 0.5078 E) 0.2567
- 30) Find the probability of at least 2 girls in 10 births. Assume that male and female births are equally likely and that the births are independent events. 30) _____
A) 0.989 B) 0.011 C) 0.044 D) 0.1 E) 0.945

Find the indicated probability.

- 31) Police estimate that 25% of drivers drive without their seat belts. If they stop 6 drivers at random, find the probability that all of them are wearing their seat belts. 31) _____
A) 0.45 B) 0.75 C) 0.0002 D) 0.15 E) 0.1780

Solve the problem.

- 32) Suppose that 12% of people are left handed. If 27 people are selected at random, what is the mean of the number of right-handers in the group? 32) _____
A) 2.85 B) 1.69 C) 13.5 D) 3.24 E) 23.76

Provide an appropriate response.

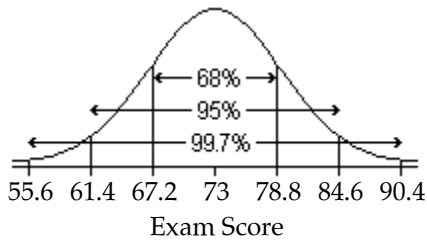
- 33) A multiple choice test consists of 60 questions. Each question has 4 possible answers only one of which is correct. A student answers 26 questions correctly. Is that enough to convince you that he is not merely guessing? Explain. 33) _____
- A) Yes; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.35. 26 is 3.3 standard deviations above the expected value. That would be an unusual result.
- B) No; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 11.25. 26 is 0.98 standard deviations above the expected value. That would not be an unusual result
- C) Yes; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.87. 26 is 2.8 standard deviations above the expected value. That would be an unusual result
- D) No; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.35. 26 is 3.3 standard deviations above the expected value. That would not be an unusual result.
- E) Yes; if the student were guessing, we would expect him to answer 15 questions correctly with a standard deviation of 3.10. 26 is 3.5 standard deviations above the expected value. That would be an unusual result.

Draw the Normal model and use the 68–95–99.7 Rule to answer the question.

34) An English instructor gave a final exam and found a mean score of 73 points and a standard deviation of 5.8 points. Assume that a Normal model can be applied. Draw and label the Normal model for the exam scores. Describe the scores of the top 2.5%.

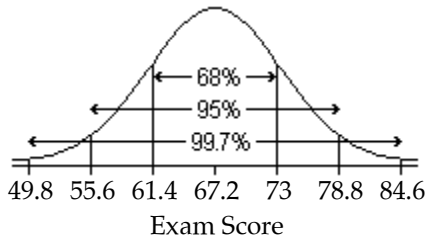
34) _____

A)



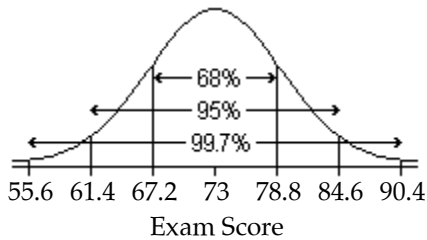
; Higher than 78.8 points

B)



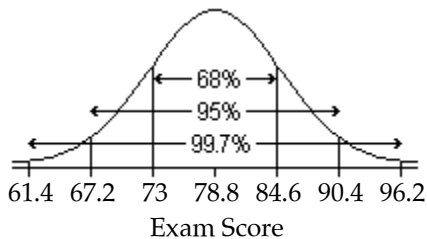
; Higher than 78.8 points

C)



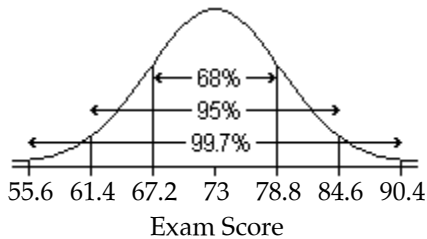
; 84.6 points

D)



; Higher than 90.4 points

E)



; Higher than 84.6 points

Solve the problem.

35) For a recent English exam, use the Normal model $N(73, 9.2)$ to find the percent of scores under 58. Round to the nearest tenth of a percent.

35) _____

A) 1.63%

B) 4.2%

C) 5.2%

D) 95.8%

E) 94.8%

Solve the problem. Round to the nearest tenth.

- 36) Based on the Normal model for snowfall in a certain town $N(57, 8)$, how many inches of snow would represent the 85th percentile? 36) _____
A) 65 inches B) 65.3 inches C) 48.5 inches D) 48.7 inches E) 49 inches

Assume that X has a normal distribution, and find the indicated probability.

- 37) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$. 37) _____
Find the probability that X is between 14.3 and 16.1.
A) 0.8413 B) 0.3413 C) 0.6826 D) 0.1587

Solve the problem.

- 38) Human body temperatures are normally distributed with a mean of 98.20°F and a standard deviation of 0.62°F . Find the temperature that separates the top 7% from the bottom 93%. 38) _____
A) 97.28°F B) 98.40°F C) 99.12°F D) 98.78°F

Find the indicated probability.

- 39) A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50. If an applicant is randomly selected, find the probability of a rating that is between 170 and 220. 39) _____
A) 0.3811 B) 0.0703 C) 0.1554 D) 0.2257

Use the given degree of confidence and sample data to construct a confidence interval for the population proportion.

- 40) Of 369 randomly selected medical students, 23 said that they planned to work in a rural community. Construct a 95% confidence interval for the percentage of all medical students who plan to work in a rural community. 40) _____
A) (3.77%, 8.70%)
B) (4.16%, 8.30%)
C) (2.99%, 9.47%)
D) (5.32%, 7.14%)
E) (3.30%, 9.17%)

Solve the problem.

- 41) A manufacturer wishes to estimate the proportion of washing machines leaving the factory that is defective. How large a sample should she check in order to be 90% confident that the true proportion is estimated to within 1.5%? 41) _____
A) 7,368
B) 4,269
C) 6,012
D) 3,007
E) Not enough information is given.
- 42) A university's administrator proposes to do an analysis of the proportion of graduates who have not found employment in their major field one year after graduation. In previous years, the percentage averaged 7%. He wants the margin of error to be within 4% at a 99% confidence level. What sample size will suffice? Use 2.575 as the critical value for a 99% confidence interval. 42) _____
A) 156 B) 11 C) 324 D) 270 E) 110

Construct the indicated confidence interval for the difference in proportions. Assume that the samples are independent and that they have been randomly selected.

- 43) A marketing survey involves product recognition in New York and California. Of 558 New Yorkers surveyed, 193 knew the product while 196 out of 614 Californians knew the product. Construct a 99% confidence interval for the difference in the proportions of New Yorkers and Californians who knew the product. 43) _____
- A) (0.0247, 0.0286)
B) (-0.0442, 0.0975)
C) (-0.0034, 0.0566)
D) (-0.0443, 0.0976)
E) (-0.0443, 0.0566)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

- 44) Suppose the proportion of women who follow a regular exercise program is p_W and the proportion of men who follow a regular exercise program is p_M . A study found a 90% confidence interval for $p_W - p_M$ is (-0.029, 0.117). Does this study provide strong evidence of a gender-based difference in exercise? Explain. 44) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Construct the requested confidence interval from the supplied information.

- 45) A sample of 81 statistics students at a small college had a mean mathematics ACT score of 26 with a standard deviation of 6. Find a 95% confidence interval for the mean mathematics ACT score for all statistics students at this college. 45) _____
- A) (24.7, 27.3) B) (25.3, 26.1) C) (25.3, 26.7) D) (25.9, 26.1) E) (78.6, 83.4)

Construct the indicated confidence interval for the difference between the two population means. Assume that the assumptions and conditions for inference have been met.

- 46) A grocery store is interested in determining whether or not a difference exists between the shelf life of two different brands of doughnuts. A random sample of 100 boxes of each brand was selected and the shelf life in days was determined for each box. The sample results are given below. 46) _____

Brand A	Brand B
$\bar{x} = 2.1$	$\bar{x} = 2.9$
$s = 0.8$	$s = 1.1$
$n = 100$	$n = 100$

Find a 90% confidence interval for $\mu_A - \mu_B$, the difference in mean shelf life between brand A and brand B.

- A) (2.1, 2.9)
B) (-1.53, -0.08)
C) (0.58, 1.03)
D) (0.08, 1.53)
E) (-1.03, -0.58)

Answer Key

Testname: SAMPLE FINAL

- 1) C
- 2) A
- 3) A
- 4) A
- 5) B
- 6) C
- 7) D
- 8) B
- 9) B
- 10) C
- 11) D
- 12) B
- 13) A
- 14) A
- 15) B
- 16) B
- 17) E
- 18) D
- 19) A
- 20) A
- 21) A
- 22) C
- 23) D
- 24) C
- 25) C
- 26) A
- 27) A
- 28) B
- 29) D
- 30) A
- 31) E
- 32) E
- 33) A
- 34) E
- 35) C
- 36) B
- 37) C
- 38) C
- 39) A
- 40) A
- 41) D
- 42) D
- 43) D
- 44) No. Since 0 is in the interval, this study does not indicate a gender-based difference in exercise percentages.
- 45) A
- 46) E