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Multiple Choice 1 point each

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

Find the mean for the given sample data.

1) The local Tupperware dealers earned these commissions last month:

\$1382.25 \$4781.58 \$1697.61 \$4202.35

\$1294.97 \$1871.42 \$1928.60

\$1075.97 \$2497.34 \$4167.92

What was the mean commission earned? Round your answer to the nearest cent.

A) \$2484.00

B) \$2490.00

C) \$3112.50

D) \$2766.67

Find the standard deviation of the data summarized in the given frequency distribution.

2) The heights of a group of professional basketball players are summarized in the frequency distribution below.

Find the standard deviation. Round your answer to one decimal place.

Height (in.)	Frequency
70 - 71	3
72 - 73	7
74 - 75	16
76 - 77	12
78 - 79	10
80 - 81	4
82 - 83	1

A) 2.8

B) 3.2

C) 2.9

D) 3.3

Find the indicated probability.

3) A bag contains 2 red marbles, 3 blue marbles, and 5 green marbles. If a marble is randomly selected from the bag, what is the probability that it is blue?

A) $\frac{1}{5}$

B) $\frac{1}{3}$

C) $\frac{3}{10}$

D) $\frac{1}{7}$

4) A study of consumer smoking habits includes 163 people in the 18–22 age bracket (44 of whom smoke), 140 people in the 23–30 age bracket (37 of whom smoke), and 81 people in the 31–40 age bracket (25 of whom smoke). If one person is randomly selected from this sample, find the probability of getting someone who is age 23–30 or smokes.

A) 0.641

B) 0.264

C) 0.544

D) 0.096

5) A batch consists of 12 defective coils and 88 good ones. Find the probability of getting two good coils when two coils are randomly selected if the first selection is replaced before the second is made.

A) 0.7744

B) 0.176

C) 0.7733

D) 0.0144

Assume that a procedure yields a binomial distribution with a trial repeated n times. Use the binomial probability formula to find the probability of x successes given the probability p of success on a single trial.

6) $n = 5, x = 2, p = 0.70$

A) 0.132

B) 0.464

C) 0.700

D) 0.198

Find the standard deviation, σ , for the binomial distribution which has the stated values of n and p . Round your answer to the nearest hundredth.

7) $n = 1731; p = .57$

A) $\sigma = 23.87$

B) $\sigma = 20.60$

C) $\sigma = 24.72$

D) $\sigma = 18.19$

Assume that the weight loss for the first month of a diet program varies between 6 pounds and 12 pounds, and is spread evenly over the range of possibilities, so that there is a uniform distribution. Find the probability of the given range of pounds lost.

8) Between 10.5 pounds and 12 pounds

A) $\frac{1}{2}$

B) $\frac{1}{4}$

C) $\frac{1}{3}$

D) $\frac{3}{4}$

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

9) The mean is $\mu = 15.2$ and the standard deviation is $\sigma = 0.9$.

Find the probability that X is between 14.3 and 16.1.

A) 0.6826

B) 0.8413

C) 0.3413

D) 0.1587

Solve the problem.

10) Assume that women have heights that are normally distributed with a mean of 63.6 inches and a standard deviation of 2.5 inches. Find the value of the quartile Q_3 .

A) 67.8 inches

B) 65.3 inches

C) 64.3 inches

D) 66.1 inches

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ . Assume that the population has a normal distribution.

11) The principal randomly selected six students to take an aptitude test. Their scores were:

78.2 81.3 86.1 84.2 72.8 85.2

Determine a 90 percent confidence interval for the mean score for all students.

A) $77.13 < \mu < 85.47$

B) $85.57 < \mu < 77.03$

C) $85.47 < \mu < 77.13$

D) $77.03 < \mu < 85.57$

Find the P-value for the indicated hypothesis test.

- 12) An airline claims that the no-show rate for passengers booked on its flights is less than 6%. Of 380 randomly selected reservations, 18 were no-shows. Find the P-value for a test of the airline's claim.
- A) 0.1492 B) 0.3508 C) 0.0746 D) 0.1230

Determine whether the hypothesis test involves a sampling distribution of means that is a normal distribution, Student t distribution, or neither.

- 13) Claim: $\mu = 965$. Sample data: $n = 20$, $\bar{x} = 917$, $s = 27$. The sample data appear to come from a normally distributed population with $\sigma = 29$.
- A) Normal B) Neither C) Student t

Given the linear correlation coefficient r and the sample size n , determine the critical values of r and use your finding to state whether or not the given r represents a significant linear correlation. Use a significance level of 0.05.

- 14) $r = 0.829$, $n = 9$
- A) Critical values: $r = -0.666$, no significant linear correlation
B) Critical values: $r = \pm 0.666$, no significant linear correlation
C) Critical values: $r = \pm 0.666$, significant linear correlation
D) Critical values: $r = 0.666$, no significant linear correlation

Find the best predicted value of y corresponding to the given value of x .

- 15) Six pairs of data yield $r = 0.444$ and the regression equation $\hat{y} = 5x + 2$. Also, $\bar{y} = 18.3$. What is the best predicted value of y for $x = 5$?
- A) 4.22 B) 18.3 C) 27 D) 93.5
- 16) Eight pairs of data yield $r = 0.708$ and the regression equation $\hat{y} = 55.8 + 2.79x$. Also, $\bar{y} = 71.125$. What is the best predicted value of y for $x = 10$?
- A) 560.79 B) 57.80 C) 71.13 D) 83.7

Given below are the analysis of variance results from a Minitab display. Assume that you want to use a 0.05 significance level in testing the null hypothesis that the different samples come from populations with the same mean.

	Source	DF	SS	MS	F	p
17)	Factor	3	13.500	4.500	5.17	0.011
	Error	16	13.925	0.870		
	Total	19	27.425			

What can you conclude about the equality of the population means?

- A) Fail to reject the null hypothesis since the p-value is less than the significance level.
- B) Reject the null hypothesis since the p-value is greater than the significance level.
- C) Fail to reject the null hypothesis since the p-value is greater than the significance level.
- D) Reject the null hypothesis since the p-value is less than the significance level.

	Source	DF	SS	MS	F	p
18)	Factor	3	30	10.00	1.6	0.264
	Error	8	50	6.25		
	Total	11	80			

What can you conclude about the equality of the population means?

- A) Fail to reject the null hypothesis since the p-value is greater than the significance level.
- B) Reject the null hypothesis since the p-value is less than the significance level.
- C) Fail to reject the null hypothesis since the p-value is less than the significance level.
- D) Reject the null hypothesis since the p-value is greater than the significance level.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question. Show your work! (4 points each)

Assume that a simple random sample has been selected from a normally distributed population. Find the test statistic, P-value, critical value(s), and state the final conclusion.

- 19) Test the claim that for the population of history exams, the mean score is 80. Sample data are summarized as $n = 16$, $\bar{x} = 84.5$, and $s = 11.2$. Use a significance level of $\alpha = 0.01$. (4 points)

Use the given degree of confidence and sample data to construct a confidence interval for the population mean μ . Assume that the population has a normal distribution.

- 20) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects. (4 points)

Identify the null hypothesis, alternative hypothesis, test statistic, P-value, conclusion about the null hypothesis, and final conclusion that addresses the original claim.

- 21) An article in a journal reports that 34% of American fathers take no responsibility for child care. A researcher claims that the figure is higher for fathers in the town of Littleton. A random sample of 234 fathers from Littleton yielded 96 who did not help with child care. Test the researcher's claim at the 0.05 significance level. (4 points)

Answer Key

Testname: M119PFINAL

- 1) B
- 2) A
- 3) C
- 4) C
- 5) A
- 6) A
- 7) B
- 8) B
- 9) A
- 10) B
- 11) A
- 12) A
- 13) A
- 14) C
- 15) B
- 16) D
- 17) D
- 18) A
- 19) $\alpha = 0.01$

Test statistic: $t = 1.61$

P-value: $p = 0.9463$

$t < 2.602$

Because $t < 2.602$, we do not reject the null hypothesis. There is not sufficient evidence to warrant rejection of the claim that the mean score is 80.

- 20) $67.7 < \mu < 84.7$

- 21) $H_0: p = 0.34$. $H_1: p > 0.34$. Test statistic: $z = 2.27$. P-value: $p = 0.0116$.

Critical value: $z = 1.645$. Reject null hypothesis. There is sufficient evidence to support the researcher's claim that the proportion for fathers in Littleton is higher than 34%.