

Choose the one best answer for the question.

Classify the following random variable according to whether it is discrete or continuous.

- 1) the speed of a car on an Atlanta freeway

A) continuous

B) discrete

1) _____

Provide an appropriate response.

- 2) Consider the discrete probability distribution to the right when answering the following question.

Find the probability that x equals 5.

x	2	5	6	8
$P(x)$	0.16	?	0.3	0.21

A) 0.67

B) 3.35

C) 1.65

D) 0.33

2) _____

- 3) Mamma Temte bakes six pies a day that cost \$2 each to produce. On 15% of the days she sells only two pies. On 30% of the days, she sells 4 pies, and on the remaining 55% of the days, she sells all six pies. If Mama Temte sells her pies for \$6 each, what is her expected profit for a day's worth of pies? [Assume that any leftover pies are given away.]

A) -\$7.20

B) -\$6.00

C) \$16.80

D) \$28.80

3) _____

- 4) Which of the below is not a requirement for binomial experiment?

A) The experiment is performed a fixed number of times.

B) The trials are mutually exclusive.

C) For each trial there are two mutually exclusive outcomes.

D) The probability of success is fixed for each trial of the experiment.

4) _____

- 5) If p is the probability of success of a binomial experiment, then the probability of failure is

A) $-p$

B) $1 - p$

C) $\frac{x}{n}$

D) $\frac{n}{x}$

5) _____

- 6) We believe that 86% of the population of all Elementary students consider statistics an exciting subject. Suppose we randomly and independently selected 29 students from the population. If the true percentage is really 86%, find the probability of observing 28 or more of the students who consider statistics to be an exciting subject in our sample of 29.

A) 0.927902

B) 0.072098

C) 0.012602

D) 0.059495

6) _____

- 7) A recent survey found that 69% of all adults over 50 wear sunglasses for driving. In a random sample of 20 adults over 50, what is the mean and standard deviation of those that wear sunglasses?

A) mean: 13.8; standard deviation: 3.71483512

B) mean: 6.2; standard deviation: 2.06833266

C) mean: 6.2; standard deviation: 3.71483512

D) mean: 13.8; standard deviation: 2.06833266

7) _____

- 8) The diameter of ball bearings produced in a manufacturing process can be explained using a uniform distribution over the interval 7.5 to 9.5 millimeters. What is the probability that a randomly selected ball bearing has a diameter greater than 8.6 millimeters?

A) 0.5059

B) 0.45

C) 4

D) 0.9053

8) _____

- 9) Compare a graph of the normal density function with mean of 0 and standard deviation of 1 with a graph of a normal density function with mean equal to 0 and standard deviation of 0.5. The graphs would _____
- A) Have no horizontal displacement but one would be flatter than the other.
 B) Have the same height but one would be shifted 4 units to the left.
 C) Have no horizontal displacement but one would be steeper than the other.
 D) Have the same height but one would be shifted 4 units to the right.

- 10) Approximately _____% of the area under the normal curve is between $\mu - 3\sigma$ and $\mu + 3\sigma$. _____
- A) 95 B) 99.7 C) 68 D) 50
- 11) Find the area under the standard normal curve between $z = -1.5$ and $z = 2.5$. _____
- A) 0.9270 B) 0.7182 C) 0.9831 D) 0.6312

Find the indicated probability.

- 12) Assume that the random variable X is normally distributed, with mean $\mu = 100$ and standard deviation $\sigma = 15$. Compute the probability $P(X > 112)$. _____
- A) 0.1977 B) 0.2420 C) 0.7881 D) 0.2119

Find the indicated z-score.

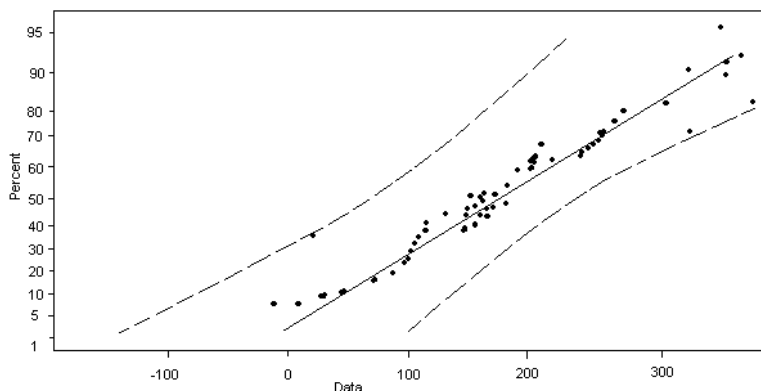
- 13) Find the z-score for which the area under the standard normal curve to its right is 0.07. _____
- A) 1.39 B) 1.48 C) 1.45 D) 1.26

Provide an appropriate response.

- 14) A physical fitness association is including the mile run in its secondary-school fitness test. The time for this event for boys in secondary school is known to possess a normal distribution with a mean of 440 seconds and a standard deviation of 60 seconds. Find the probability that a randomly selected boy in secondary school will take longer than 302 seconds to run the mile. _____
- A) 0.4893 B) 0.5107 C) 0.9893 D) 0.0107

Use a normal probability plot to assess whether the sample data could have come from a population that is normally distributed.

- 15) Determine whether the following normal probability plot indicates that the sample data could have come from a population that is normally distributed. _____

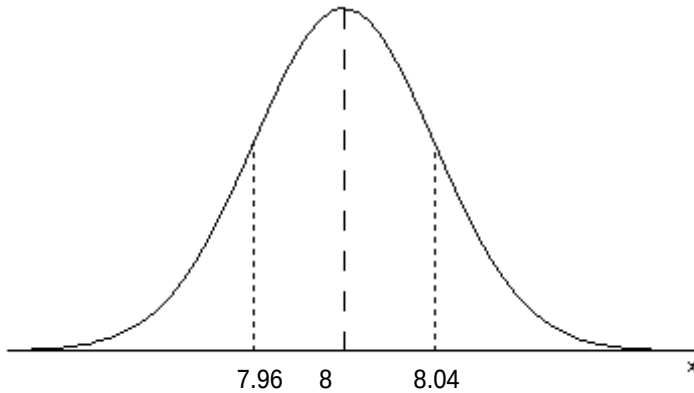


- A) normally distributed B) not normally distributed

Provide an appropriate response.

- 16) If sample data are taken from a population that is normally distributed, a normal probability plot of the observed data values versus the expected z scores will 16) _____
- A) be approximately linear. B) have a correlation coefficient near 0.
C) look exponential in nature. D) have no discernable pattern.

- 17) What are the values of $\mu_{\bar{x}}$ and $\sigma_{\bar{x}}$ for the sampling distribution of the sample mean shown? 17) _____



- A) $\mu_{\bar{x}} = 8, \sigma_{\bar{x}} = 0.04$ B) $\mu_{\bar{x}} = 8, \sigma_{\bar{x}} = 0.12$
C) $\mu_{\bar{x}} = 8, \sigma_{\bar{x}} = 0.08$ D) $\mu_{\bar{x}} = 0.04, \sigma_{\bar{x}} = 8$
- 18) The average score of all golfers for a particular course has a mean of 75 and a standard deviation of 4.5. Suppose 81 golfers played the course today. Find the probability that the average score of the 81 golfers exceeded 76. 18) _____
- A) 0.4772 B) 0.0228 C) 0.3707 D) 0.1293

- 19) The standard error of the mean is given by 19) _____
- A) $\frac{\sigma}{\sqrt{n}}$ B) $\mu \pm \sigma$ C) $\mu - \bar{x}$ D) $|\mu - \bar{x}|$

- 20) If a population proportion is believed to be 0.6, how many items must be sampled to ensure that the sampling distribution of $\hat{p}$ will be approximately normal? Assume that the size of the population is $N = 10,000$. 20) _____
- A) 60 B) 13 C) 30 D) 42

- 21) The National Association of Realtors estimates that 23% of all homes purchased in 2004 were considered investment properties. If a sample of 800 homes sold in 2004 is obtained what is the probability that at most 200 homes are going to be used as investment property? 21) _____
- A) 0.9099 B) 0.0934 C) 0.4066 D) 0.5935

- 22) A survey of 700 non-fatal accidents showed that 143 involved faulty equipment. Find a point estimate for p, the population proportion of accidents that involved faulty equipment. 22) _____
- A) 0.796 B) 0.170 C) 0.204 D) 0.257

Determine the critical value $z_{\alpha/2}$ that corresponds to the given level of confidence.

- 23) 88% 23) _____
- A) 0.81 B) 1.21 C) 1.175 D) 1.555

Provide an appropriate response.

- 24) Many people think that a national lobby's successful fight against gun control legislation is reflecting the will of a minority of Americans. A random sample of 4000 citizens yielded 2250 who are in favor of gun control legislation. Estimate the true proportion of all Americans who are in favor of gun control legislation using a 99% confidence interval. Express the answer in the form $\hat{p} \pm E$ and round to the nearest ten-thousandth. 24) _____
- A) 0.5625 ± 0.0202 B) 0.4375 ± 0.0202 C) 0.4375 ± 0.6337 D) 0.5625 ± 0.6337

- 25) A confidence interval for p can be constructed using 25) _____
- A) $\hat{p} \pm z \frac{\sigma}{n}$ B) $p \pm z_{\alpha/2} \sqrt{\frac{p(1-p)}{n}}$
- C) $\hat{p} \pm z \sqrt{\frac{\sigma}{n}}$ D) $\hat{p} \pm z_{\alpha/2} \sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

- 26) A researcher wishes to estimate the number of households with two computers. How large a sample is needed in order to be 98% confident that the sample proportion will not differ from the true proportion by more than 2%? A previous study indicates that the proportion of households with two computers is 20%. 26) _____
- A) 2172 B) 3 C) 2715 D) 1537

Find the t-value.

- 27) Find the critical t-value that corresponds to 99% confidence and $n = 10$. 27) _____
- A) 1.833 B) 3.250 C) 2.262 D) 2.821

Provide an appropriate response.

- 28) How much money does the average professional hockey fan spend on food at a single hockey game? That question was posed to 10 randomly selected hockey fans. The sampled results show that sample mean and standard deviation were \$19.00 and \$2.6, respectively. Use this information to create a 95% confidence interval for the mean. Express the answer in the form $\bar{x} \pm t_{\alpha/2}(s/\sqrt{n})$. 28) _____
- A) $19 \pm 1.833(2.6/\sqrt{10})$ B) $19 \pm 2.201(2.6/\sqrt{10})$
- C) $19 \pm 2.228(2.6/\sqrt{10})$ D) $19 \pm 2.262(2.6/\sqrt{10})$

- 29) Construct a 98% confidence interval for the population mean, μ . Assume the population has a normal distribution. A study of 14 car owners showed that their average repair bill was \$192 with a standard deviation of \$8. Round to the nearest cent. 29) _____
- A) (\$328.33, \$386.99) B) (\$115.40, \$158.80)
- C) (\$186.33, \$197.67) D) (\$222.33, \$256.10)

- 30) What effect will an outlier have on a confidence interval that is based on a small sample size? 30) _____
- A) The interval will be the same with or without the outlier.
- B) The interval will be smaller than an interval without the outlier.
- C) The interval will reveal exclusionary data.
- D) The confidence interval will be wider than an interval without the outlier.

- 31) A _____ is a statement or claim regarding a characteristic of one or more populations. 31) _____
- A) fact B) hypothesis C) conjecture D) conclusion

- 32) True or False: If I specify β to be equal to 0.36, then the value of α must be 0.64. 32) _____
 A) False B) True
- 33) We never conclude "Accept H_0 " in a test of hypothesis. This is because: 33) _____
 A) The rejection region is not known. B) α is the probability of a Type I error.
 C) The p-value is not small enough. D) $\beta = p(\text{Type II error})$ is not known.
- 34) The level of significance, α , is the probability of making a 34) _____
 A) Correct decision B) Type β error
 C) Type I error D) Type II error
- 35) The mean monthly gasoline bill for one household is greater than \$150. If a hypothesis test is performed, how should you interpret a decision that rejects the null hypothesis? 35) _____
 A) There is not sufficient evidence to support the claim $\mu > \$150$.
 B) There is not sufficient evidence to reject the claim $\mu > \$150$.
 C) There is sufficient evidence to support the claim $\mu > \$150$.
 D) There is sufficient evidence to reject the claim $\mu > \$150$.
- 36) Find the critical value for a two-tailed test with $\alpha = 0.08$. 36) _____
 A) ± 1.75 B) ± 2.65 C) ± 1.96 D) ± 1.405
- 37) Find the standardized test statistic t for a sample with $n = 12$, $\bar{x} = 30.2$, $s = 2.2$, and $\alpha = 0.01$ if $H_0: \mu = 29$. Round your answer to three decimal places. 37) _____
 A) 2.001 B) 1.991 C) 1.890 D) 2.132
- Find the critical value.
- 38) Determine the critical value for a left-tailed test of a population mean at the $\alpha = 0.005$ level of significance based on a sample size of $n = 30$. 38) _____
 A) 2.756 B) 2.750 C) -2.756 D) -1.699
- Provide an appropriate response.
- 39) A local eat-in pizza restaurant wants to investigate the possibility of starting to deliver pizzas. The owner of the store has determined that home delivery will be successful if the average time spent on the deliveries does not exceed 32 minutes. The owner has randomly selected 23 customers and has delivered pizzas to their homes in order to test if the mean delivery time actually exceeds 32 minutes. Suppose the P-value for the test was found to be 0.0297. State the correct conclusion. 39) _____
 A) At $\alpha = 0.03$, we fail to reject H_0 . B) At $\alpha = 0.02$, we reject H_0 .
 C) At $\alpha = 0.05$, we fail to reject H_0 . D) At $\alpha = 0.025$, we fail to reject H_0 .
- 40) True or False: Results that are practically significant will always be statistically significant. 40) _____
 A) True B) False
- 41) Classify the two given samples as independent or dependent. 41) _____
 Sample 1: The scores of 16 students who took a statistics final
 Sample 2: The scores of 16 different students who took a physics final
 A) dependent B) independent

- 42) Find the standardized test statistic, z , to test the hypothesis that $p_1 \neq p_2$. Use $\alpha = 0.02$. The sample statistics listed below are from independent samples. 42) _____
- Sample statistics: $n_1 = 1000$, $x_1 = 250$, and $n_2 = 1200$, $x_2 = 195$
- A) 5.087 B) 2.798 C) 3.212 D) 4.761
- 43) To perform a hypothesis test of two population proportions, the pooled estimate of p must be determined. The pooled estimate, $\hat{p}$, is 43) _____
- A) $\hat{p} = \frac{x_1}{n_1} + \frac{x_2}{n_2}$ B) $\hat{p} = \frac{x_1 + x_2}{n_1 + n_2}$
- C) $\hat{p} = \frac{n_2 x_1 + n_1 x_2}{n_1 + n_2}$ D) $\hat{p} = \frac{x_1 + x_2}{n_1 n_2}$
- 44) A controversial bill is being debated in the state legislature. Representative Williams wants to estimate within 2 percentage points and with 95% confidence the difference in the proportion of her male and female constituents who favor the bill. What sample size should she obtain? 44) _____
- A) $n_1 = n_2 = 3383$ B) $n_1 = n_2 = 2401$ C) $n_1 = n_2 = 4802$ D) $n_1 = n_2 = 97$
- 45) Find the standardized test statistic, t , to test the hypothesis that $\mu_1 < \mu_2$. Two samples are randomly selected and come from populations that are normal. The sample statistics are given below. 45) _____
- $n_1 = 15$ $n_2 = 15$
 $\bar{x}_1 = 27.44$ $\bar{x}_2 = 29.99$
 $s_1 = 2.9$ $s_2 = 2.8$
- A) -0.669 B) -2.450 C) -1.667 D) -3.165