First Exam - Statistics 13
November 7, 2014

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

Solve the problem.

1) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the sample of interest for this study. 1) _____
   A) the current price (or closing price) of a NYSE stock
   B) the entire set of stocks that are traded on the NYSE
   C) a single stock traded on the NYSE
   D) the 500 NYSE stocks that current prices were collected from

2) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the population of interest in this study. 2) _____
   A) the response (Yes/No) to the question, "Have you taken at least one online class?"
   B) the number of online classes a student has taken
   C) all community college students in the state of Georgia
   D) the 1500 community college students contacted

3) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the variable of interest in this study. 3) _____
   A) the 1500 community college students contacted
   B) the response (Yes/No) to the question, "Have you taken at least one online class?"
   C) all community college students in the state of Georgia
   D) the number of online classes a student has taken

4) What method of data collection would you use to collect data for a study where a drug was given to 40 patients and a placebo to another group of 40 patients to determine if the drug has an effect on a patient's illness? 4) _____
   A) published source
   B) survey
   C) designed experiment
   D) observational study

5) What number is missing from the table? 5) _____

Grades on Test	Frequency	Relative Frequency
A	6	.24
B	7	
C	9	.36
D	2	.08
F	1	.04

A) .28 B) .72 C) .70 D) .07

6) 252 randomly sampled college students were asked, among other things, to estimate their college grade point average (GPA). The responses are shown in the stem-and-leaf plot shown below. Notice that a GPA of 3.65 would be indicated with a stem of 36 and a leaf of 5 in the plot. How many of the students who responded had GPA's that exceeded 3.55? 6) _____

Stem and Leaf Plot of GPA

Leaf Digit Unit = 0.01 Minimum 1.9900
19 9 represents 1.99 Median 3.1050
Maximum 4.0000

	Stem	Leaves
1	19	9
5	20	0668
6	21	0
11	22	05567
15	23	0113
20	24	00005
33	25	0000000000067
46	26	0000005577789
61	27	000000134455578
79	28	000000000144667799
88	29	002356777
116	30	00000000000000000000011344559
(19)	31	0000000000112235666
117	32	00000000000000000345568
95	33	000000000025557
80	34	00000000000000000333444566677889
49	35	000003355566677899
31	36	000005
25	37	022235588899
13	38	00002579
5	39	7
4	40	0000

252 cases included

A) 31 B) 39 C) 49 D) 19

7) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 99 miles per hour. Suppose that the statistician indicated that the serve speed distribution was skewed to the left. Which of the following values is most likely the value of the median serve speed? 7) _____

A) 94 mph B) 89 mph C) 104 mph D) 99 mph

8) The distribution of salaries of professional basketball players is skewed to the right. Which measure of central tendency would be the best measure to determine the location of the center of the distribution? 8) _____

A) range B) mean C) mode D) median

9) The amount spent on textbooks for the fall term was recorded for a sample of five university students - $400, $350, $600, $525, and $450. Calculate the value of the sample standard deviation for the data. 9) _____

A) $450 B) $250 C) $99.37 D) $98.75

10) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 101 miles per hour (mph) and the standard deviation of the serve speeds was 14 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was mound-shaped and symmetric. What proportion of the player's serves was between 129 mph and 143 mph? 10) _____

A) 0.997 B) 0.047 C) 143 D) 0.0235

11) The amount of time workers spend commuting to their jobs each day in a large metropolitan city has a mean of 70 minutes and a standard deviation of 20 minutes. Assuming nothing is known about the shape of the distribution of commuting times, what percentage of these commuting times are between 30 and 110 minutes? 11) _____

A) at least 75% B) at least 89% C) at least 95% D) at least 0%

12) A bag of candy was opened and the number of pieces was counted. The results are shown in the table below: 12) _____

Color	Number
Red	25
Brown	20
Green	20
Blue	15
Yellow	10
Orange	10

List the sample space for this problem.

A) {Red, Brown, Green, Blue, Yellow, Orange}

B) {0.25, 0.20, 0.20, 0.15, 0.10, 0.10}

C) {Red}

D) {25, 20, 20, 15, 10, 10}

13) The table displays the probabilities for each of the outcomes when three fair coins are tossed and the number of heads is counted. Find the probability that the number of heads on a single toss of the three coins is at most 2. 13) _____

Outcome	0	1	2	3
Probability	.125	.375	.375	.125

A) .750 B) .875 C) .500 D) .125

14) Two chips are drawn at random and without replacement from a bag containing four blue chips and three red chips. Find the probability of drawing two red chips. 14) _____

A) $\frac{1}{12}$ B) $\frac{1}{7}$ C) $\frac{9}{49}$ D) $\frac{6}{7}$

15) A number between 1 and 10, inclusive, is randomly chosen. Events A and B are defined as follows. 15) _____

A: {The number is even}
B: {The number is less than 7}

Identify the sample points in the event $A \cup B$.

A) {1, 2, 3, 4, 5, 6, 7, 8, 10}
B) {2, 4, 6}
C) {1, 2, 3, 4, 5, 6, 7, 9}
D) {1, 2, 3, 4, 5, 6, 8, 10}

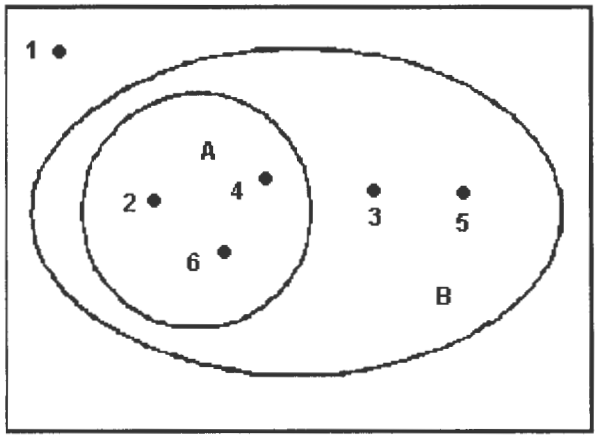
16) A sample of 350 students was selected and each was asked the make of their automobile (foreign or domestic) and their year in college (freshman, sophomore, junior, or senior). The results are shown in the table below. 16) _____

		Year in College				
		Freshman	Sophomore	Junior	Senior	Total
Car	Foreign	15	65	100	25	205
	Domestic	10	45	80	10	145
	Total	25	110	180	35	350

Find the probability that a randomly selected student is both a sophomore and drives a foreign automobile.

A) 65/205
B) 65/350
C) 45/350
D) 65/110

17) The following Venn diagram shows the six possible outcomes when rolling a fair die. Let A be the event of rolling an even number and let B be the event of rolling a number greater than 1. 17) _____



Which of the following expressions describes the event of rolling a 1?

A) B
B) B^c
C) A^c
D) $A \cup B$

18) A clothing vendor estimates that 78 out of every 100 of its online customers do not live within 50 miles of one of its physical stores. Using this estimate, what is that probability that a a randomly selected online customer lives within 50 miles of a physical store? 18) _____

A) .78
B) .28
C) .22
D) .50

19) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man or earning a B. 19) _____

A) .24
B) .8
C) .54
D) .4

20) Each manager of a corporation was rated as being either a good, fair, or poor manager by his/her boss. The manager's educational background was also noted. The data appear below: 20) _____

	Educational Background				
Manager Rating	H. S. Degree	Some College	College Degree	Master's or Ph.D.	Totals
Good	3	8	27	1	39
Fair	2	19	48	18	87
Poor	5	4	1	24	34
Totals	10	31	76	43	160

What is the probability that a randomly chosen manager is either a good managers or has an advanced degree?

A) $\frac{41}{80}$ B) $\frac{1}{160}$ C) $\frac{81}{160}$ D) $\frac{159}{160}$

21) In a class of 40 students, 22 are women, 10 are earning an A, and 7 are women that are earning an A. If a student is randomly selected from the class, find the probability that the student is a woman given that the student is earning an A. 21) _____

A) $\frac{11}{20}$ B) $\frac{5}{11}$ C) $\frac{7}{22}$ D) $\frac{7}{10}$

22) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man given that the student earning a B. 22) _____

A) $\frac{1}{3}$ B) 1 C) 0 D) $\frac{3}{5}$

23) The manager of a used car lot took inventory of the automobiles on his lot and constructed the following table based on the age of each car and its make (foreign or domestic): 23) _____

	Age of Car (in years)				
Make	0 – 2	3 – 5	6 – 10	over 10	Total
Foreign	43	20	10	27	100
Domestic	42	29	12	17	100
Total	85	49	22	44	200

A car was randomly selected from the lot. Given that the car selected was a foreign car, what is the probability that it was older than 2 years old?

A) $\frac{57}{115}$ B) $\frac{57}{100}$ C) $\frac{43}{100}$ D) $\frac{43}{115}$

24) For two events, A and B, $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, and $P(A \cap B) = \frac{1}{4}$. Find $P(B \mid A)$. 24) _____

A) $\frac{1}{2}$ B) $\frac{3}{4}$ C) $\frac{1}{12}$ D) $\frac{1}{8}$

25) A one-week study revealed that 60% of a warehouse store's customers are women and that 30% of women customers spend at least $250 on a single visit to the store. Find the probability that a randomly chosen customer will be a woman who spends at least $250. 25) _____

A) 0.18 B) 0.90 C) 0.36 D) 0.50

26) If $P(A \mid B) = 0$ and $P(A) \neq 0$, then which statement is false? 26) _____

A) Events A and B are mutually exclusive.
B) Events A and B are independent.
C) Events A and B are dependent.
D) Events A and B have no sample points in common.

27) The probability that an individual is left-handed is 0.19. In a class of 90 students, what is the mean and standard deviation of the number of left-handed students? Round to the nearest hundredth when necessary. 27) _____

A) mean: 90; standard deviation: 4.14 B) mean: 90; standard deviation: 3.72
C) mean: 17.1; standard deviation: 4.14 D) mean: 17.1; standard deviation: 3.72

28) We believe that 81% of the population of all Business Statistics students consider statistics to be an exciting subject. Suppose we randomly and independently selected 39 students from the population. How many of the sampled students do we expect to consider statistics to be an exciting subject? 28) _____

A) 39 B) 31.59 C) 33.82 D) 32.16

29) Find a value of the standard normal random variable z, called z_0, such that $P(z \geq z_0) = 0.70$. 29) _____

A) -.81 B) -.53 C) -.47 D) -.98

30) For a standard normal random variable, find the point in the distribution in which 11.9% of the z-values fall below. 30) _____

A) -1.45 B) -0.30 C) -1.18 D) 1.18

31) 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 40 seconds. The fitness association wants to recognize the fastest 10% of the boys with certificates of recognition. What time would the boys need to beat in order to earn a certificate of recognition from the fitness association? 31) _____

A) 505.8 seconds B) 388.8 seconds C) 491.2 seconds D) 374.2 seconds

32) Before a new phone system was installed, the amount a company spent on personal calls followed a normal distribution with an average of $600 per month and a standard deviation of $50 per month. Refer to such expenses as PCE's (personal call expenses). Using the distribution above, what is the probability that during a randomly selected month PCE's were between $475.00 and $690.00? 32) _____

A) .0001 B) .0421 C) .9999 D) .9579

33) The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60,000 miles and a standard deviation of 2400 miles. What is the probability a certain tire of this brand will last between 54,960 miles and 55,680 miles? 33) _____

A) .4649 B) .4920 C) .9813 D) .0180

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

Solve the problem.

1) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the sample of interest for this study. 1) _____
   A) the entire set of stocks that are traded on the NYSE
   B) the 500 NYSE stocks that current prices were collected from
   C) a single stock traded on the NYSE
   D) the current price (or closing price) of a NYSE stock

2) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the population of interest in this study. 2) _____
   A) all community college students in the state of Georgia
   B) the 1500 community college students contacted
   C) the response (Yes/No) to the question, "Have you taken at least one online class?"
   D) the number of online classes a student has taken

3) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the variable of interest in this study. 3) _____
   A) the number of online classes a student has taken
   B) the response (Yes/No) to the question, "Have you taken at least one online class?"
   C) all community college students in the state of Georgia
   D) the 1500 community college students contacted

4) What method of data collection would you use to collect data for a study where a drug was given to 88 patients and a placebo to another group of 88 patients to determine if the drug has an effect on a patient's illness? 4) _____
   A) observational study
   B) designed experiment
   C) survey
   D) published source

5) What number is missing from the table? 5) _____

Grades on Test	Frequency	Relative Frequency
A	6	.24
B	7	
C	9	.36
D	2	.08
F	1	.04

A) .72 B) .70 C) .28 D) .07

6) 252 randomly sampled college students were asked, among other things, to estimate their college grade point average (GPA). The responses are shown in the stem-and-leaf plot shown below. Notice that a GPA of 3.65 would be indicated with a stem of 36 and a leaf of 5 in the plot. How many of the students who responded had GPA's that exceeded 3.55? 6) _____

Stem and Leaf Plot of GPA

Leaf Digit Unit = 0.01 Minimum 1.9900
19 9 represents 1.99 Median 3.1050
Maximum 4.0000

	Stem	Leaves
1	19	9
5	20	0668
6	21	0
11	22	05567
15	23	0113
20	24	00005
33	25	0000000000067
46	26	0000005577789
61	27	000000134455578
79	28	000000000144667799
88	29	002356777
116	30	00000000000000000000011344559
(19)	31	0000000000112235666
117	32	00000000000000000345568
95	33	000000000025557
80	34	00000000000000000333444566677889
49	35	000003355566677899
31	36	000005
25	37	022235588899
13	38	00002579
5	39	7
4	40	0000

252 cases included

A) 19 B) 49 C) 39 D) 31

7) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 103 miles per hour. Suppose that the statistician indicated that the serve speed distribution was skewed to the left. Which of the following values is most likely the value of the median serve speed? 7) _____

A) 89 mph B) 110 mph C) 103 mph D) 96 mph

8) The distribution of salaries of professional basketball players is skewed to the right. Which measure of central tendency would be the best measure to determine the location of the center of the distribution? 8) _____

A) median B) mean C) range D) mode

9) The amount spent on textbooks for the fall term was recorded for a sample of five university students - $400, $350, $600, $525, and $450. Calculate the value of the sample standard deviation for the data. 9) _____

A) $450 B) $98.75 C) $250 D) $99.37

10) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 96 miles per hour (mph) and the standard deviation of the serve speeds was 12 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was mound-shaped and symmetric. What proportion of the player's serves was between 108 mph and 132 mph? 10) _____

A) 0.997 B) 0.317 C) 0.1585 D) 132

11) The amount of time workers spend commuting to their jobs each day in a large metropolitan city has a mean of 70 minutes and a standard deviation of 20 minutes. Assuming nothing is known about the shape of the distribution of commuting times, what percentage of these commuting times are between 30 and 110 minutes? 11) _____

A) at least 89% B) at least 75% C) at least 95% D) at least 0%

12) A bag of candy was opened and the number of pieces was counted. The results are shown in the table below: 12) _____

Color	Number
Red	25
Brown	20
Green	20
Blue	15
Yellow	10
Orange	10

List the sample space for this problem.

A) {Red}

B) {25, 20, 20, 15, 10, 10}

C) {0.25, 0.20, 0.20, 0.15, 0.10, 0.10}

D) {Red, Brown, Green, Blue, Yellow, Orange}

13) The table displays the probabilities for each of the outcomes when three fair coins are tossed and the number of heads is counted. Find the probability that the number of heads on a single toss of the three coins is at most 2. 13) _____

Outcome	0	1	2	3
Probability	.125	.375	.375	.125

A) .875 B) .750 C) .500 D) .125

14) Two chips are drawn at random and without replacement from a bag containing four blue chips and three red chips. Find the probability of drawing two red chips. 14) _____

A) $\frac{9}{49}$ B) $\frac{1}{12}$ C) $\frac{6}{7}$ D) $\frac{1}{7}$

15) A number between 1 and 10, inclusive, is randomly chosen. Events A and B are defined as follows. 15) _____

A: {The number is even}
B: {The number is less than 7}

Identify the sample points in the event $A \cup B$.

A) {1, 2, 3, 4, 5, 6, 8, 10}
B) {1, 2, 3, 4, 5, 6, 7, 8, 10}
C) {2, 4, 6}
D) {1, 2, 3, 4, 5, 6, 7, 9}

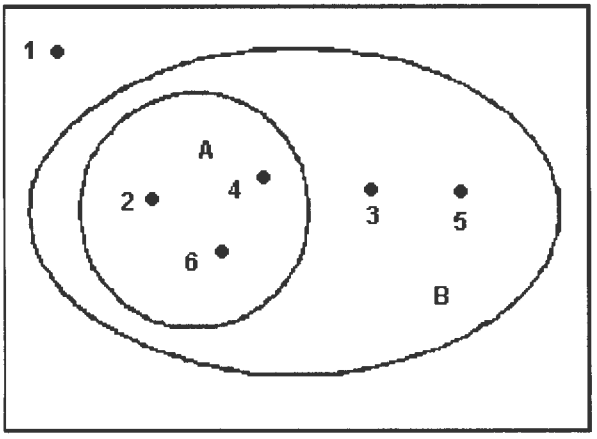
16) A sample of 350 students was selected and each was asked the make of their automobile (foreign or domestic) and their year in college (freshman, sophomore, junior, or senior). The results are shown in the table below. 16) _____

		Year in College				
		Freshman	Sophomore	Junior	Senior	Total
Car	Foreign	15	65	100	25	205
	Domestic	10	45	80	10	145
	Total	25	110	180	35	350

Find the probability that a randomly selected student is both a sophomore and drives a foreign automobile.

A) 65/110
B) 65/350
C) 65/205
D) 45/350

17) The following Venn diagram shows the six possible outcomes when rolling a fair die. Let A be the event of rolling an even number and let B be the event of rolling a number greater than 1. 17) _____



Which of the following expressions describes the event of rolling a 1?

A) $A \cup B$
B) B
C) A^C
D) B^C

18) A clothing vendor estimates that 78 out of every 100 of its online customers do not live within 50 miles of one of its physical stores. Using this estimate, what is that probability that a a randomly selected online customer lives within 50 miles of a physical store? 18) _____

A) .50
B) .28
C) .78
D) .22

19) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man or earning a B. 19) _____

A) .24
B) .54
C) .8
D) .4

20) Each manager of a corporation was rated as being either a good, fair, or poor manager by his/her boss. The manager's educational background was also noted. The data appear below: 20) _____

Educational Background

Manager Rating	H. S. Degree	Some College	College Degree	Master's or Ph.D.	Totals
Good	3	7	24	5	39
Fair	6	18	49	14	87
Poor	8	4	2	20	34
Totals	17	29	75	39	160

What is the probability that a randomly chosen manager is either a good managers or has an advanced degree?

A) $\frac{31}{32}$ B) $\frac{39}{80}$ C) $\frac{1}{32}$ D) $\frac{73}{160}$

21) In a class of 40 students, 22 are women, 10 are earning an A, and 7 are women that are earning an A. If a student is randomly selected from the class, find the probability that the student is a woman given that the student is earning an A. 21) _____

A) $\frac{7}{22}$ B) $\frac{11}{20}$ C) $\frac{7}{10}$ D) $\frac{5}{11}$

22) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man given that the student earning a B. 22) _____

A) $\frac{3}{5}$ B) $\frac{1}{3}$ C) 1 D) 0

23) The manager of a used car lot took inventory of the automobiles on his lot and constructed the following table based on the age of each car and its make (foreign or domestic): 23) _____

Age of Car (in years)

Make	0 – 2	3 – 5	6 – 10	over 10	Total
Foreign	42	24	12	22	100
Domestic	45	28	10	17	100
Total	87	52	22	39	200

A car was randomly selected from the lot. Given that the car selected was a foreign car, what is the probability that it was older than 2 years old?

A) $\frac{42}{113}$ B) $\frac{29}{50}$ C) $\frac{21}{50}$ D) $\frac{58}{113}$

24) For two events, A and B, $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, and $P(A \cap B) = \frac{1}{4}$. Find $P(B \mid A)$. 24) _____

A) $\frac{1}{8}$ B) $\frac{1}{12}$ C) $\frac{1}{2}$ D) $\frac{3}{4}$

25) A one-week study revealed that 60% of a warehouse store's customers are women and that 30% of women customers spend at least $250 on a single visit to the store. Find the probability that a randomly chosen customer will be a woman who spends at least $250. 25) _____

A) 0.90 B) 0.50 C) 0.18 D) 0.36

26) If $P(A \mid B) = 0$ and $P(A) \neq 0$, then which statement is false? 26) _____

A) Events A and B are dependent.
B) Events A and B have no sample points in common.
C) Events A and B are independent.
D) Events A and B are mutually exclusive.

27) The probability that an individual is left-handed is 0.13. In a class of 100 students, what is the mean and standard deviation of the number of left-handed students? Round to the nearest hundredth when necessary. 27) _____

A) mean: 13; standard deviation: 3.61 B) mean: 100; standard deviation: 3.61
C) mean: 13; standard deviation: 3.36 D) mean: 100; standard deviation: 3.36

28) We believe that 81% of the population of all Business Statistics students consider statistics to be an exciting subject. Suppose we randomly and independently selected 39 students from the population. How many of the sampled students do we expect to consider statistics to be an exciting subject? 28) _____

A) 39 B) 32.16 C) 33.82 D) 31.59

29) Find a value of the standard normal random variable z, called z_0, such that $P(z \geq z_0) = 0.70$. 29) _____

A) -.53 B) -.98 C) -.81 D) -.47

30) For a standard normal random variable, find the point in the distribution in which 11.9% of the z-values fall below. 30) _____

A) 1.18 B) -1.18 C) -0.30 D) -1.45

31) 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 460 seconds and a standard deviation of 60 seconds. The fitness association wants to recognize the fastest 10% of the boys with certificates of recognition. What time would the boys need to beat in order to earn a certificate of recognition from the fitness association? 31) _____

A) 361.3 seconds B) 383.2 seconds C) 558.7 seconds D) 536.8 seconds

32) Before a new phone system was installed, the amount a company spent on personal calls followed a normal distribution with an average of $700 per month and a standard deviation of $50 per month. Refer to such expenses as PCE's (personal call expenses). Using the distribution above, what is the probability that during a randomly selected month PCE's were between $575.00 and $790.00? 32) _____

A) .9999 B) .9579 C) .0421 D) .0001

33) The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60,000 miles and a standard deviation of 2500 miles. What is the probability a certain tire of this brand will last between 54,750 miles and 55,500 miles? 33) _____

A) .4920 B) .0180 C) .9813 D) .4649

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

Solve the problem.

1) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the sample of interest for this study. 1) _____
   A) the current price (or closing price) of a NYSE stock
   B) the entire set of stocks that are traded on the NYSE
   C) the 500 NYSE stocks that current prices were collected from
   D) a single stock traded on the NYSE

2) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the population of interest in this study. 2) _____
   A) the number of online classes a student has taken
   B) the 1500 community college students contacted
   C) the response (Yes/No) to the question, "Have you taken at least one online class?"
   D) all community college students in the state of Georgia

3) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the variable of interest in this study. 3) _____
   A) the response (Yes/No) to the question, "Have you taken at least one online class?"
   B) all community college students in the state of Georgia
   C) the 1500 community college students contacted
   D) the number of online classes a student has taken

4) What method of data collection would you use to collect data for a study where a drug was given to 28 patients and a placebo to another group of 28 patients to determine if the drug has an effect on a patient's illness? 4) _____
   A) designed experiment
   B) survey
   C) published source
   D) observational study

5) What number is missing from the table? 5) _____

Grades on Test	Frequency	Relative Frequency
A	6	.24
B	7	
C	9	.36
D	2	.08
F	1	.04

A) .28 B) .70 C) .07 D) .72

6) 252 randomly sampled college students were asked, among other things, to estimate their college grade point average (GPA). The responses are shown in the stem-and-leaf plot shown below. Notice that a GPA of 3.65 would be indicated with a stem of 36 and a leaf of 5 in the plot. How many of the students who responded had GPA's that exceeded 3.55? 6) _____

Stem and Leaf Plot of GPA

Leaf Digit Unit = 0.01 Minimum 1.9900
19 9 represents 1.99 Median 3.1050
Maximum 4.0000

	Stem	Leaves
1	19	9
5	20	0668
6	21	0
11	22	05567
15	23	0113
20	24	00005
33	25	0000000000067
46	26	0000005577789
61	27	000000134455578
79	28	000000000144667799
88	29	002356777
116	30	00000000000000000000011344559
(19)	31	0000000000112235666
117	32	00000000000000000345568
95	33	000000000025557
80	34	00000000000000000333444566677889
49	35	000003355566677899
31	36	000005
25	37	022235588899
13	38	00002579
5	39	7
4	40	0000

252 cases included

A) 19 B) 39 C) 31 D) 49

7) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 96 miles per hour. Suppose that the statistician indicated that the serve speed distribution was skewed to the left. Which of the following values is most likely the value of the median serve speed? 7) _____

A) 90 mph B) 102 mph C) 96 mph D) 84 mph

8) The distribution of salaries of professional basketball players is skewed to the right. Which measure of central tendency would be the best measure to determine the location of the center of the distribution? 8) _____

A) mode B) range C) median D) mean

9) The amount spent on textbooks for the fall term was recorded for a sample of five university students – $400, $350, $600, $525, and $450. Calculate the value of the sample standard deviation for the data. 9) _____

A) $450 B) $99.37 C) $98.75 D) $250

10) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 98 miles per hour (mph) and the standard deviation of the serve speeds was 10 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was mound-shaped and symmetric. What proportion of the player's serves was between 118 mph and 128 mph? 10) _____

A) 128 B) 0.997 C) 0.047 D) 0.0235

11) The amount of time workers spend commuting to their jobs each day in a large metropolitan city has a mean of 70 minutes and a standard deviation of 20 minutes. Assuming nothing is known about the shape of the distribution of commuting times, what percentage of these commuting times are between 30 and 110 minutes? 11) _____

A) at least 89% B) at least 75% C) at least 0% D) at least 95%

12) A bag of candy was opened and the number of pieces was counted. The results are shown in the table below: 12) _____

Color	Number
Red	25
Brown	20
Green	20
Blue	15
Yellow	10
Orange	10

List the sample space for this problem.

A) {0.25, 0.20, 0.20, 0.15, 0.10, 0.10}

B) {25, 20, 20, 15, 10, 10}

C) {Red}

D) {Red, Brown, Green, Blue, Yellow, Orange}

13) The table displays the probabilities for each of the outcomes when three fair coins are tossed and the number of heads is counted. Find the probability that the number of heads on a single toss of the three coins is at most 2. 13) _____

Outcome	0	1	2	3
Probability	.125	.375	.375	.125

A) .875 B) .125 C) .750 D) .500

14) Two chips are drawn at random and without replacement from a bag containing four blue chips and three red chips. Find the probability of drawing two red chips. 14) _____

A) $\frac{1}{12}$ B) $\frac{6}{7}$ C) $\frac{9}{49}$ D) $\frac{1}{7}$

15) A number between 1 and 10, inclusive, is randomly chosen. Events A and B are defined as follows. 15) _____

A: {The number is even}
B: {The number is less than 7}

Identify the sample points in the event $A \cup B$.

A) {1, 2, 3, 4, 5, 6, 8, 10}
B) {2, 4, 6}
C) {1, 2, 3, 4, 5, 6, 7, 9}
D) {1, 2, 3, 4, 5, 6, 7, 8, 10}

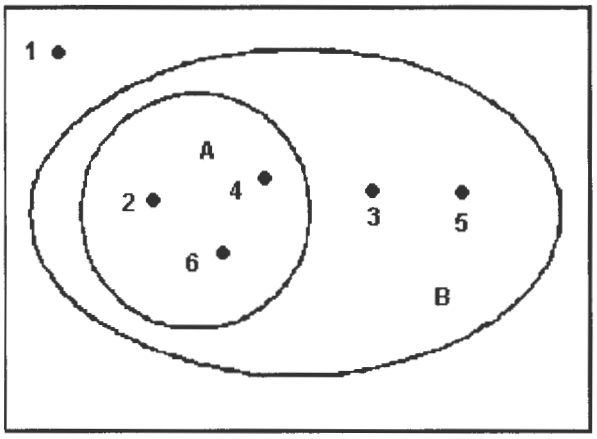
16) A sample of 350 students was selected and each was asked the make of their automobile (foreign or domestic) and their year in college (freshman, sophomore, junior, or senior). The results are shown in the table below. 16) _____

		Year in College				
		Freshman	Sophomore	Junior	Senior	Total
Car	Foreign	15	65	100	25	205
	Domestic	10	45	80	10	145
	Total	25	110	180	35	350

Find the probability that a randomly selected student is both a sophomore and drives a foreign automobile.

A) 45/350
B) 65/110
C) 65/350
D) 65/205

17) The following Venn diagram shows the six possible outcomes when rolling a fair die. Let A be the event of rolling an even number and let B be the event of rolling a number greater than 1. 17) _____



Which of the following expressions describes the event of rolling a 1?

A) $A \cup B$
B) A^C
C) B
D) B^C

18) A clothing vendor estimates that 78 out of every 100 of its online customers do not live within 50 miles of one of its physical stores. Using this estimate, what is that probability that a a randomly selected online customer lives within 50 miles of a physical store? 18) _____

A) .50
B) .22
C) .78
D) .28

19) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man or earning a B. 19) _____

A) .54
B) .4
C) .8
D) .24

20) Each manager of a corporation was rated as being either a good, fair, or poor manager by his/her boss. The manager's educational background was also noted. The data appear below: 20) _____

Educational Background

Manager Rating	H. S. Degree	Some College	College Degree	Master's or Ph.D.	Totals
Good	1	4	28	6	39
Fair	3	19	43	22	87
Poor	9	7	5	13	34
Totals	13	30	76	41	160

What is the probability that a randomly chosen manager is either a good managers or has an advanced degree?

A) $\frac{1}{2}$ B) $\frac{37}{80}$ C) $\frac{3}{80}$ D) $\frac{77}{80}$

21) In a class of 40 students, 22 are women, 10 are earning an A, and 7 are women that are earning an A. If a student is randomly selected from the class, find the probability that the student is a woman given that the student is earning an A. 21) _____

A) $\frac{11}{20}$ B) $\frac{5}{11}$ C) $\frac{7}{10}$ D) $\frac{7}{22}$

22) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man given that the student earning a B. 22) _____

A) $\frac{1}{3}$ B) $\frac{3}{5}$ C) 1 D) 0

23) The manager of a used car lot took inventory of the automobiles on his lot and constructed the following table based on the age of each car and its make (foreign or domestic): 23) _____

Age of Car (in years)

Make	0 - 2	3 - 5	6 - 10	over 10	Total
Foreign	38	26	11	25	100
Domestic	40	28	15	17	100
Total	78	54	26	42	200

A car was randomly selected from the lot. Given that the car selected was a foreign car, what is the probability that it was older than 2 years old?

A) $\frac{19}{61}$ B) $\frac{31}{61}$ C) $\frac{19}{50}$ D) $\frac{31}{50}$

24) For two events, A and B, $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, and $P(A \cap B) = \frac{1}{4}$. Find $P(B \mid A)$. 24) _____

A) $\frac{1}{2}$ B) $\frac{1}{12}$ C) $\frac{3}{4}$ D) $\frac{1}{8}$

25) A one-week study revealed that 60% of a warehouse store's customers are women and that 30% of women customers spend at least $250 on a single visit to the store. Find the probability that a randomly chosen customer will be a woman who spends at least $250. 25) _____

A) 0.18 B) 0.36 C) 0.90 D) 0.50

26) If $P(A \mid B) = 0$ and $P(A) \neq 0$, then which statement is false? 26) _____

A) Events A and B are dependent.
B) Events A and B are independent.
C) Events A and B have no sample points in common.
D) Events A and B are mutually exclusive.

27) The probability that an individual is left-handed is 0.16. In a class of 40 students, what is the mean and standard deviation of the number of left-handed students? Round to the nearest hundredth when necessary. 27) _____

A) mean: 6.4; standard deviation: 2.32 B) mean: 6.4; standard deviation: 2.53
C) mean: 40; standard deviation: 2.32 D) mean: 40; standard deviation: 2.53

28) We believe that 81% of the population of all Business Statistics students consider statistics to be an exciting subject. Suppose we randomly and independently selected 39 students from the population. How many of the sampled students do we expect to consider statistics to be an exciting subject? 28) _____

A) 39 B) 31.59 C) 32.16 D) 33.82

29) Find a value of the standard normal random variable z, called z_0, such that $P(z \geq z_0) = 0.70$. 29) _____

A) -.81 B) -.47 C) -.53 D) -.98

30) For a standard normal random variable, find the point in the distribution in which 11.9% of the z-values fall below. 30) _____

A) -1.18 B) 1.18 C) -1.45 D) -0.30

31) 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 450 seconds and a standard deviation of 60 seconds. The fitness association wants to recognize the fastest 10% of the boys with certificates of recognition. What time would the boys need to beat in order to earn a certificate of recognition from the fitness association? 31) _____

A) 351.3 seconds B) 526.8 seconds C) 373.2 seconds D) 548.7 seconds

32) Before a new phone system was installed, the amount a company spent on personal calls followed a normal distribution with an average of $500 per month and a standard deviation of $50 per month. Refer to such expenses as PCE's (personal call expenses). Using the distribution above, what is the probability that during a randomly selected month PCE's were between $375.00 and $590.00? 32) _____

A) .0001 B) .0421 C) .9999 D) .9579

33) The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60,000 miles and a standard deviation of 2100 miles. What is the probability a certain tire of this brand will last between 55,590 miles and 56,220 miles? 33) _____

A) .4920 B) .4649 C) .9813 D) .0180

First Exam - Statistics 13
November 7, 2014

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

Solve the problem.

1) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the sample of interest for this study. 1) _____
   A) the entire set of stocks that are traded on the NYSE
   B) the current price (or closing price) of a NYSE stock
   C) the 500 NYSE stocks that current prices were collected from
   D) a single stock traded on the NYSE

2) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the population of interest in this study. 2) _____
   A) the number of online classes a student has taken
   B) all community college students in the state of Georgia
   C) the 1500 community college students contacted
   D) the response (Yes/No) to the question, "Have you taken at least one online class?"

3) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the variable of interest in this study. 3) _____
   A) the 1500 community college students contacted
   B) the response (Yes/No) to the question, "Have you taken at least one online class?"
   C) all community college students in the state of Georgia
   D) the number of online classes a student has taken

4) What method of data collection would you use to collect data for a study where a drug was given to 65 patients and a placebo to another group of 65 patients to determine if the drug has an effect on a patient's illness? 4) _____
   A) designed experiment
   B) observational study
   C) survey
   D) published source

5) What number is missing from the table? 5) _____

Grades on Test	Frequency	Relative Frequency
A	6	.24
B	7	
C	9	.36
D	2	.08
F	1	.04

A) .07 B) .70 C) .72 D) .28

6) 252 randomly sampled college students were asked, among other things, to estimate their college grade point average (GPA). The responses are shown in the stem-and-leaf plot shown below. Notice that a GPA of 3.65 would be indicated with a stem of 36 and a leaf of 5 in the plot. How many of the students who responded had GPA's that exceeded 3.55? 6) _____

Stem and Leaf Plot of GPA

Leaf Digit Unit = 0.01 Minimum 1.9900
19 9 represents 1.99 Median 3.1050
Maximum 4.0000

	Stem	Leaves
1	19	9
5	20	0668
6	21	0
11	22	05567
15	23	0113
20	24	00005
33	25	0000000000067
46	26	0000005577789
61	27	000000134455578
79	28	000000000144667799
88	29	002356777
116	30	00000000000000000000011344559
(19)	31	0000000000112235666
117	32	00000000000000000345568
95	33	000000000025557
80	34	00000000000000000333444566677889
49	35	000003355566677899
31	36	000005
25	37	022235588899
13	38	00002579
5	39	7
4	40	0000

252 cases included

A) 39 B) 19 C) 31 D) 49

7) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 95 miles per hour. Suppose that the statistician indicated that the serve speed distribution was skewed to the left. Which of the following values is most likely the value of the median serve speed? 7) _____

A) 103 mph B) 79 mph C) 87 mph D) 95 mph

8) The distribution of salaries of professional basketball players is skewed to the right. Which measure of central tendency would be the best measure to determine the location of the center of the distribution? 8) _____

A) mean B) range C) median D) mode

9) The amount spent on textbooks for the fall term was recorded for a sample of five university students - $400, $350, $600, $525, and $450. Calculate the value of the sample standard deviation for the data. 9) _____

A) $250 B) $99.37 C) $98.75 D) $450

10) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 103 miles per hour (mph) and the standard deviation of the serve speeds was 10 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was mound-shaped and symmetric. What proportion of the player's serves was between 113 mph and 133 mph? 10) _____

A) 133 B) 0.317 C) 0.997 D) 0.1585

11) The amount of time workers spend commuting to their jobs each day in a large metropolitan city has a mean of 70 minutes and a standard deviation of 20 minutes. Assuming nothing is known about the shape of the distribution of commuting times, what percentage of these commuting times are between 30 and 110 minutes? 11) _____

A) at least 0% B) at least 75% C) at least 95% D) at least 89%

12) A bag of candy was opened and the number of pieces was counted. The results are shown in the table below: 12) _____

Color	Number
Red	25
Brown	20
Green	20
Blue	15
Yellow	10
Orange	10

List the sample space for this problem.

A) {Red, Brown, Green, Blue, Yellow, Orange}

B) {25, 20, 20, 15, 10, 10}

C) {0.25, 0.20, 0.20, 0.15, 0.10, 0.10}

D) {Red}

13) The table displays the probabilities for each of the outcomes when three fair coins are tossed and the number of heads is counted. Find the probability that the number of heads on a single toss of the three coins is at most 2. 13) _____

Outcome	0	1	2	3
Probability	.125	.375	.375	.125

A) .875 B) .750 C) .125 D) .500

14) Two chips are drawn at random and without replacement from a bag containing four blue chips and three red chips. Find the probability of drawing two red chips. 14) _____

A) $\frac{1}{7}$ B) $\frac{1}{12}$ C) $\frac{6}{7}$ D) $\frac{9}{49}$

15) A number between 1 and 10, inclusive, is randomly chosen. Events A and B are defined as follows. 15) _____

A: {The number is even}
B: {The number is less than 7}

Identify the sample points in the event $A \cup B$.

A) {1, 2, 3, 4, 5, 6, 8, 10}
B) {1, 2, 3, 4, 5, 6, 7, 9}
C) {2, 4, 6}
D) {1, 2, 3, 4, 5, 6, 7, 8, 10}

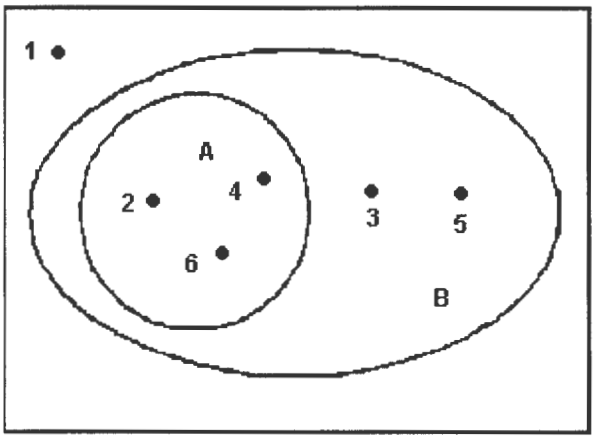
16) A sample of 350 students was selected and each was asked the make of their automobile (foreign or domestic) and their year in college (freshman, sophomore, junior, or senior). The results are shown in the table below. 16) _____

		Year in College				
		Freshman	Sophomore	Junior	Senior	Total
Car	Foreign	15	65	100	25	205
	Domestic	10	45	80	10	145
	Total	25	110	180	35	350

Find the probability that a randomly selected student is both a sophomore and drives a foreign automobile.

A) 65/110 B) 45/350 C) 65/205 D) 65/350

17) The following Venn diagram shows the six possible outcomes when rolling a fair die. Let A be the event of rolling an even number and let B be the event of rolling a number greater than 1. 17) _____



Which of the following expressions describes the event of rolling a 1?

A) A^c B) B C) $A \cup B$ D) B^c

18) A clothing vendor estimates that 78 out of every 100 of its online customers do not live within 50 miles of one of its physical stores. Using this estimate, what is that probability that a a randomly selected online customer lives within 50 miles of a physical store? 18) _____

A) .28 B) .78 C) .50 D) .22

19) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man or earning a B. 19) _____

A) .24 B) .8 C) .4 D) .54

20) Each manager of a corporation was rated as being either a good, fair, or poor manager by his/her boss. The manager's educational background was also noted. The data appear below: 20) _____

Educational Background

Manager Rating	H. S. Degree	Some College	College Degree	Master's or Ph.D.	Totals
Good	6	9	23	1	39
Fair	8	17	42	20	87
Poor	7	5	3	19	34
Totals	21	31	68	40	160

What is the probability that a randomly chosen manager is either a good manager or has an advanced degree?

A) $\frac{1}{160}$ B) $\frac{79}{160}$ C) $\frac{39}{80}$ D) $\frac{159}{160}$

21) In a class of 40 students, 22 are women, 10 are earning an A, and 7 are women that are earning an A. If a student is randomly selected from the class, find the probability that the student is a woman given that the student is earning an A. 21) _____

A) $\frac{7}{22}$ B) $\frac{7}{10}$ C) $\frac{5}{11}$ D) $\frac{11}{20}$

22) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man given that the student earning a B. 22) _____

A) 1 B) 0 C) $\frac{3}{5}$ D) $\frac{1}{3}$

23) The manager of a used car lot took inventory of the automobiles on his lot and constructed the following table based on the age of each car and its make (foreign or domestic): 23) _____

Age of Car (in years)

Make	0 - 2	3 - 5	6 - 10	over 10	Total
Foreign	38	24	13	25	100
Domestic	44	26	14	16	100
Total	82	50	27	41	200

A car was randomly selected from the lot. Given that the car selected was a foreign car, what is the probability that it was older than 2 years old?

A) $\frac{19}{50}$ B) $\frac{19}{59}$ C) $\frac{31}{59}$ D) $\frac{31}{50}$

24) For two events, A and B, $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, and $P(A \cap B) = \frac{1}{4}$. Find $P(B \mid A)$. 24) _____

A) $\frac{1}{8}$ B) $\frac{1}{12}$ C) $\frac{3}{4}$ D) $\frac{1}{2}$

25) A one-week study revealed that 60% of a warehouse store's customers are women and that 30% of women customers spend at least $250 on a single visit to the store. Find the probability that a randomly chosen customer will be a woman who spends at least $250. 25) _____

A) 0.90 B) 0.36 C) 0.50 D) 0.18

26) If $P(A \mid B) = 0$ and $P(A) \neq 0$, then which statement is false? 26) _____

A) Events A and B are mutually exclusive.
B) Events A and B are dependent.
C) Events A and B are independent.
D) Events A and B have no sample points in common.

27) The probability that an individual is left-handed is 0.15. In a class of 90 students, what is the mean and standard deviation of the number of left-handed students? Round to the nearest hundredth when necessary. 27) _____

A) mean: 90; standard deviation: 3.39 B) mean: 13.5; standard deviation: 3.39
C) mean: 13.5; standard deviation: 3.67 D) mean: 90; standard deviation: 3.67

28) We believe that 81% of the population of all Business Statistics students consider statistics to be an exciting subject. Suppose we randomly and independently selected 39 students from the population. How many of the sampled students do we expect to consider statistics to be an exciting subject? 28) _____

A) 31.59 B) 32.16 C) 33.82 D) 39

29) Find a value of the standard normal random variable z, called z_0, such that $P(z \geq z_0) = 0.70$. 29) _____

A) -.47 B) -.53 C) -.81 D) -.98

30) For a standard normal random variable, find the point in the distribution in which 11.9% of the z-values fall below. 30) _____

A) 1.18 B) -0.30 C) -1.18 D) -1.45

31) 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. The fitness association wants to recognize the fastest 10% of the boys with certificates of recognition. What time would the boys need to beat in order to earn a certificate of recognition from the fitness association? 31) _____

A) 516.8 seconds B) 363.2 seconds C) 341.3 seconds D) 538.7 seconds

32) Before a new phone system was installed, the amount a company spent on personal calls followed a normal distribution with an average of $900 per month and a standard deviation of $50 per month. Refer to such expenses as PCE's (personal call expenses). Using the distribution above, what is the probability that during a randomly selected month PCE's were between $775.00 and $990.00? 32) _____

A) .9999 B) .0001 C) .9579 D) .0421

33) The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60,000 miles and a standard deviation of 2400 miles. What is the probability a certain tire of this brand will last between 54,960 miles and 55,680 miles? 33) _____

A) .9813 B) .4920 C) .4649 D) .0180

First Exam - Statistics 13
November 7, 2014

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

Solve the problem.

1) As part of an economics class project, students were asked to randomly select 500 New York Stock Exchange (NYSE) stocks from the Wall Street Journal. As part of the project, students were asked to summarize the current prices (also referred to as the closing price of the stock for a particular trading date) of the collected stocks using graphical and numerical techniques. Identify the sample of interest for this study. 1) _____
   A) the entire set of stocks that are traded on the NYSE
   B) a single stock traded on the NYSE
   C) the 500 NYSE stocks that current prices were collected from
   D) the current price (or closing price) of a NYSE stock

2) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the population of interest in this study. 2) _____
   A) the number of online classes a student has taken
   B) the response (Yes/No) to the question, "Have you taken at least one online class?"
   C) all community college students in the state of Georgia
   D) the 1500 community college students contacted

3) A study in the state of Georgia was conducted to determine the percentage of all community college students who have taken at least one online class. 1500 community college students were contacted and asked if they had taken at least one online class during their time at their community college. These responses were then used to estimate the percentage of all community college students who have taken at least one online class. Identify the variable of interest in this study. 3) _____
   A) all community college students in the state of Georgia
   B) the number of online classes a student has taken
   C) the response (Yes/No) to the question, "Have you taken at least one online class?"
   D) the 1500 community college students contacted

4) What method of data collection would you use to collect data for a study where a drug was given to 55 patients and a placebo to another group of 55 patients to determine if the drug has an effect on a patient's illness? 4) _____
   A) designed experiment
   B) published source
   C) observational study
   D) survey

5) What number is missing from the table? 5) _____

Grades on Test	Frequency	Relative Frequency
A	6	.24
B	7	
C	9	.36
D	2	.08
F	1	.04

A) .28 B) .70 C) .72 D) .07

6) 252 randomly sampled college students were asked, among other things, to estimate their college grade point average (GPA). The responses are shown in the stem-and-leaf plot shown below. Notice that a GPA of 3.65 would be indicated with a stem of 36 and a leaf of 5 in the plot. How many of the students who responded had GPA's that exceeded 3.55? 6) _____

Stem and Leaf Plot of GPA

Leaf Digit Unit = 0.01
19 9 represents 1.99

Minimum 1.9900
Median 3.1050
Maximum 4.0000

	Stem	Leaves
1	19	9
5	20	0668
6	21	0
11	22	05567
15	23	0113
20	24	00005
33	25	0000000000067
46	26	0000005577789
61	27	000000134455578
79	28	000000000144667799
88	29	002356777
116	30	00000000000000000000011344559
(19)	31	0000000000112235666
117	32	00000000000000000345568
95	33	000000000025557
80	34	00000000000000000333444566677889
49	35	000003355566677899
31	36	000005
25	37	022235588899
13	38	00002579
5	39	7
4	40	0000

252 cases included

A) 39 B) 31 C) 49 D) 19

7) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 102 miles per hour. Suppose that the statistician indicated that the serve speed distribution was skewed to the left. Which of the following values is most likely the value of the median serve speed? 7) _____

A) 111 mph B) 102 mph C) 93 mph D) 84 mph

8) The distribution of salaries of professional basketball players is skewed to the right. Which measure of central tendency would be the best measure to determine the location of the center of the distribution? 8) _____

A) median B) mode C) mean D) range

9) The amount spent on textbooks for the fall term was recorded for a sample of five university students - $400, $350, $600, $525, and $450. Calculate the value of the sample standard deviation for the data. 9) _____

A) $98.75 B) $250 C) $99.37 D) $450

10) At the U.S. Open Tennis Championship a statistician keeps track of every serve that a player hits during the tournament. The statistician reported that the mean serve speed of a particular player was 102 miles per hour (mph) and the standard deviation of the serve speeds was 14 mph. Assume that the statistician also gave us the information that the distribution of the serve speeds was mound-shaped and symmetric. What proportion of the player's serves was between 116 mph and 144 mph? 10) _____

A) 0.1585 B) 144 C) 0.317 D) 0.997

11) The amount of time workers spend commuting to their jobs each day in a large metropolitan city has a mean of 70 minutes and a standard deviation of 20 minutes. Assuming nothing is known about the shape of the distribution of commuting times, what percentage of these commuting times are between 30 and 110 minutes? 11) _____

A) at least 75% B) at least 95% C) at least 0% D) at least 89%

12) A bag of candy was opened and the number of pieces was counted. The results are shown in the table below: 12) _____

Color	Number
Red	25
Brown	20
Green	20
Blue	15
Yellow	10
Orange	10

List the sample space for this problem.

A) {Red}

B) {25, 20, 20, 15, 10, 10}

C) {0.25, 0.20, 0.20, 0.15, 0.10, 0.10}

D) {Red, Brown, Green, Blue, Yellow, Orange}

13) The table displays the probabilities for each of the outcomes when three fair coins are tossed and the number of heads is counted. Find the probability that the number of heads on a single toss of the three coins is at most 2. 13) _____

Outcome	0	1	2	3
Probability	.125	.375	.375	.125

A) .750 B) .500 C) .125 D) .875

14) Two chips are drawn at random and without replacement from a bag containing four blue chips and three red chips. Find the probability of drawing two red chips. 14) _____

A) $\frac{9}{49}$ B) $\frac{6}{7}$ C) $\frac{1}{7}$ D) $\frac{1}{12}$

15) A number between 1 and 10, inclusive, is randomly chosen. Events A and B are defined as follows. 15) _____

A: {The number is even}
B: {The number is less than 7}

Identify the sample points in the event $A \cup B$.

A) {1, 2, 3, 4, 5, 6, 7, 9}
B) {1, 2, 3, 4, 5, 6, 7, 8, 10}
C) {1, 2, 3, 4, 5, 6, 8, 10}
D) {2, 4, 6}

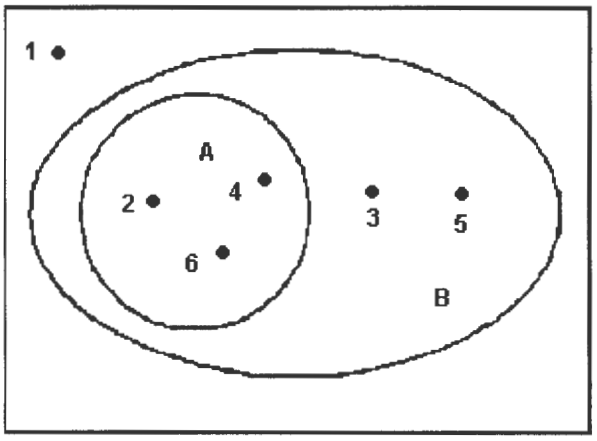
16) A sample of 350 students was selected and each was asked the make of their automobile (foreign or domestic) and their year in college (freshman, sophomore, junior, or senior). The results are shown in the table below. 16) _____

		Year in College				
		Freshman	Sophomore	Junior	Senior	Total
Car	Foreign	15	65	100	25	205
	Domestic	10	45	80	10	145
	Total	25	110	180	35	350

Find the probability that a randomly selected student is both a sophomore and drives a foreign automobile.

A) 65/110 B) 65/350 C) 45/350 D) 65/205

17) The following Venn diagram shows the six possible outcomes when rolling a fair die. Let A be the event of rolling an even number and let B be the event of rolling a number greater than 1. 17) _____



Which of the following expressions describes the event of rolling a 1?

A) B B) A^c C) $A \cup B$ D) B^c

18) A clothing vendor estimates that 78 out of every 100 of its online customers do not live within 50 miles of one of its physical stores. Using this estimate, what is that probability that a a randomly selected online customer lives within 50 miles of a physical store? 18) _____

A) .22 B) .28 C) .50 D) .78

19) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man or earning a B. 19) _____

A) .24 B) .8 C) .54 D) .4

20) Each manager of a corporation was rated as being either a good, fair, or poor manager by his/her boss. The manager's educational background was also noted. The data appear below: 20) _____

Educational Background

Manager Rating	H. S. Degree	Some College	College Degree	Master's or Ph.D.	Totals
Good	3	6	27	3	39
Fair	9	13	49	16	87
Poor	1	7	4	22	34
Totals	13	26	80	41	160

What is the probability that a randomly chosen manager is either a good managers or has an advanced degree?

A) $\frac{3}{160}$ B) $\frac{157}{160}$ C) $\frac{77}{160}$ D) $\frac{1}{2}$

21) In a class of 40 students, 22 are women, 10 are earning an A, and 7 are women that are earning an A. If a student is randomly selected from the class, find the probability that the student is a woman given that the student is earning an A. 21) _____

A) $\frac{7}{22}$ B) $\frac{11}{20}$ C) $\frac{7}{10}$ D) $\frac{5}{11}$

22) In a class of 30 students, 18 are men, 6 are earning a B, and no men are earning a B. If a student is randomly selected from the class, find the probability that the student is a man given that the student earning a B. 22) _____

A) $\frac{1}{3}$ B) 0 C) 1 D) $\frac{3}{5}$

23) The manager of a used car lot took inventory of the automobiles on his lot and constructed the following table based on the age of each car and its make (foreign or domestic): 23) _____

Age of Car (in years)

Make	0 - 2	3 - 5	6 - 10	over 10	Total
Foreign	36	30	12	22	100
Domestic	38	26	11	25	100
Total	74	56	23	47	200

A car was randomly selected from the lot. Given that the car selected was a foreign car, what is the probability that it was older than 2 years old?

A) $\frac{9}{25}$ B) $\frac{16}{25}$ C) $\frac{2}{7}$ D) $\frac{32}{63}$

24) For two events, A and B, $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$, and $P(A \cap B) = \frac{1}{4}$. Find $P(B \mid A)$. 24) _____

A) $\frac{1}{8}$ B) $\frac{1}{2}$ C) $\frac{1}{12}$ D) $\frac{3}{4}$

25) A one-week study revealed that 60% of a warehouse store's customers are women and that 30% of women customers spend at least $250 on a single visit to the store. Find the probability that a randomly chosen customer will be a woman who spends at least $250. 25) _____

A) 0.18 B) 0.36 C) 0.50 D) 0.90

26) If $P(A \mid B) = 0$ and $P(A) \neq 0$, then which statement is false? 26) _____

A) Events A and B are mutually exclusive.
B) Events A and B are independent.
C) Events A and B are dependent.
D) Events A and B have no sample points in common.

27) The probability that an individual is left-handed is 0.1. In a class of 50 students, what is the mean and standard deviation of the number of left-handed students? Round to the nearest hundredth when necessary. 27) _____

A) mean: 5; standard deviation: 2.12 B) mean: 5; standard deviation: 2.24
C) mean: 50; standard deviation: 2.24 D) mean: 50; standard deviation: 2.12

28) We believe that 81% of the population of all Business Statistics students consider statistics to be an exciting subject. Suppose we randomly and independently selected 39 students from the population. How many of the sampled students do we expect to consider statistics to be an exciting subject? 28) _____

A) 31.59 B) 33.82 C) 39 D) 32.16

29) Find a value of the standard normal random variable z, called z_0, such that $P(z \geq z_0) = 0.70$. 29) _____

A) -.98 B) -.53 C) -.47 D) -.81

30) For a standard normal random variable, find the point in the distribution in which 11.9% of the z-values fall below. 30) _____

A) -0.30 B) -1.45 C) 1.18 D) -1.18

31) 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 460 seconds and a standard deviation of 50 seconds. The fitness association wants to recognize the fastest 10% of the boys with certificates of recognition. What time would the boys need to beat in order to earn a certificate of recognition from the fitness association? 31) _____

A) 524 seconds B) 542.25 seconds C) 377.75 seconds D) 396 seconds

32) Before a new phone system was installed, the amount a company spent on personal calls followed a normal distribution with an average of $400 per month and a standard deviation of $50 per month. Refer to such expenses as PCE's (personal call expenses). Using the distribution above, what is the probability that during a randomly selected month PCE's were between $275.00 and $490.00? 32) _____

A) .0001 B) .9999 C) .9579 D) .0421

33) The tread life of a particular brand of tire is a random variable best described by a normal distribution with a mean of 60,000 miles and a standard deviation of 1800 miles. What is the probability a certain tire of this brand will last between 56,220 miles and 56,760 miles? 33) _____

A) .0180 B) .4920 C) .9813 D) .4649