

Math 221: Basic Statistics Exam #2A

Week #10

Name: _____

INSTRUCTIONS: You may use a calculator for this exam and a letter-sized study sheet with information written on a single side. You must show all of your work in order to receive full credit. Read each question carefully. Be certain that you have answered the question that was asked. Answers supplied as decimals must be accurate to *at least four decimal digits*.

Problem	Points	Score
1	11	
2	11	
3	11	
4	11	
5	11	
6	11	
7	11	
8	11	
9	11	
10	11	
Total	100	

- (1) The following table shows the results of a survey in which men and women workers ages 25 to 64 were asked if they have at least one month's income set aside for emergencies.

	Men	Women	Total
Less than one month's income	48	58	
One month's income or more	54	45	
Total			

- (a) Fill in the margins of the table.
- (b) Find the probability that a randomly selected worker has less than a month's income set aside?
- (c) **Given** that a randomly selected worker is male, find the probability that he has less than a month's income set aside?
- (d) **Given** that a randomly selected worker has less than a month's income set aside, find the probability that he is male?
- (e) Are the events "having less than a month's income set aside" and "being male" independent or dependent? Explain your answer.

(2) Louis and Rachel both rent videos from the local Blockbuster. Louis returns videos late 30% of the time and Rachel returns videos late 10% of the time. They each rent a video and return them **independently**. What is the probability that

(a) Both return their videos late?

(b) Both return their videos on time?

(c) **At least one** returns the video late?

- (3) A market research company conducts a survey to determine the number of computers (x) owned in households throughout the country. The results are listed as an empirical probability distribution below.

x	p	xp	x^2p
0	0.35		
1	0.29		
2	0.23		
3			
Total			

- (a) Use the rules of probability to fill in the missing value in the second column.
- (b) Fill in the remaining two columns and compute their totals.
- (c) Calculate the mean number of computers per household μ .
- (d) Calculate the variance σ^2 and standard deviation σ .

(4) A surgical technique is performed on seven patients. You are told that there is a 66% chance of success for each patient. Use the binomial distribution to find the probability that the surgery will be successful for

(a) Exactly five patients.

(b) **At least** six patients.

(c) Five **or fewer** patients.

(5) It is estimated that sharks kill an average of 10 people each year worldwide. Use the Poisson distribution to calculate the probability that in a single year

(a) Exactly 7 people will be killed by sharks.

(b) **At most** one person is killed by a shark.

(c) **At least** two people are killed by sharks.

(6) Fill in the following standard normal probabilities or z-values?

(a) $P(Z < 1.64) =$ _____

(b) $P(Z > -2.64) =$ _____

(c) $P(-2.64 < Z < 1.64) =$ _____

(d) $P(Z < \text{_____}) = 0.54$

(7) A study by the Centers for Disease Control and Prevention (CDC) found that women ages 20-29 have a cholesterol level that is normally distributed with a mean μ of 183 and a standard deviation σ of 37.2.

(a) Find the probability that a random woman in this age group will have a cholesterol level above 183.

(b) Find the probability that a random woman in this age group will have a cholesterol level below 211.

(c) 91% of women in this age group have a cholesterol level below what value? (Round your answer to the nearest integer.)

(8) The per capita consumption of red meat by people in the U.S. in a recent year was normally distributed with a mean μ of 116.7 pounds and a standard deviation σ of 37.4 pounds. Random samples of 22 people are chosen from the U.S. population and sample means \bar{X} are computed.

(a) What is the standard error of the sample means $\sigma_{\bar{X}}$?

(b) What is the probability that the sample mean \bar{X} is greater than 105 pounds?

(c) 91% of samples have a sample average \bar{X} that lies below what value?

(9) A random sample of 41 gas grills has a mean price \bar{X} of \$630.90 and a standard deviation S of \$46.70.

(a) Construct a 90% confidence interval estimate of the population mean μ .

(b) Construct a 95% confidence interval estimate of the population mean μ .

- (10) The grade point averages for 9 randomly selected college students at DeVry are listed below.

0.7	1.4	1.6	1.8	2.0	2.3	2.3	3.1	3.3
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- (a) Compute the sample mean \bar{X} .
- (b) Compute the sample standard deviation S .
- (c) Use this information to determine a 98% confidence interval estimate of the mean GPA at DeVry.

Math 221: Basic Statistics Exam #2B

Week #10

Name: _____

INSTRUCTIONS: You may use a calculator for this exam and a letter-sized study sheet with information written on a single side. You must show all of your work in order to receive full credit. Read each question carefully. Be certain that you have answered the question that was asked. Answers supplied as decimals must be accurate to *at least four decimal digits*.

Problem	Points	Score
1	11	
2	11	
3	11	
4	11	
5	11	
6	11	
7	11	
8	11	
9	11	
10	11	
Total	100	

- (1) The following table shows the results of a survey in which men and women workers ages 25 to 64 were asked if they have at least one month's income set aside for emergencies.

	Men	Women	Total
Less than one month's income	49	57	
One month's income or more	53	46	
Total			

- (a) Fill in the margins of the table.
- (b) Find the probability that a randomly selected worker has less than a month's income set aside?
- (c) **Given** that a randomly selected worker is male, find the probability that he has less than a month's income set aside?
- (d) **Given** that a randomly selected worker has less than a month's income set aside, find the probability that he is male?
- (e) Are the events "having less than a month's income set aside" and "being male" independent or dependent? Explain your answer.

(2) Louis and Rachel both rent videos from the local Blockbuster. Louis returns videos late 40% of the time and Rachel returns videos late 20% of the time. They each rent a video and return them **independently**. What is the probability that

(a) Both return their videos late?

(b) Both return their videos on time?

(c) **At least one** returns the video late?

- (3) A market research company conducts a survey to determine the number of computers (x) owned in households throughout the country. The results are listed as an empirical probability distribution below.

x	p	xp	x^2p
0	0.34		
1	0.28		
2	0.22		
3			
Total			

- (a) Use the rules of probability to fill in the missing value in the second column.
- (b) Fill in the remaining two columns and compute their totals.
- (c) Calculate the mean number of computers per household μ .
- (d) Calculate the variance σ^2 and standard deviation σ .

(4) A surgical technique is performed on seven patients. You are told that there is a 73% chance of success for each patient. Use the binomial distribution to find the probability that the surgery will be successful for

(a) Exactly five patients.

(b) **At least** six patients.

(c) Five **or fewer** patients.

(5) It is estimated that sharks kill an average of 9 people each year worldwide. Use the Poisson distribution to calculate the probability that in a single year

(a) Exactly 7 people will be killed by sharks.

(b) **At most** one person is killed by a shark.

(c) **At least** two people are killed by sharks.

(6) Fill in the following standard normal probabilities or z-values?

(a) $P(Z < 1.76) =$ _____

(b) $P(Z > -2.76) =$ _____

(c) $P(-2.76 < Z < 1.76) =$ _____

(d) $P(Z < \text{_____}) = 0.65$

(7) A study by the Centers for Disease Control and Prevention (CDC) found that women ages 20-29 have a cholesterol level that is normally distributed with a mean μ of 183 and a standard deviation σ of 37.2.

(a) Find the probability that a random woman in this age group will have a cholesterol level above 183.

(b) Find the probability that a random woman in this age group will have a cholesterol level below 223.

(c) 92% of women in this age group have a cholesterol level below what value? (Round your answer to the nearest integer.)

(8) The per capita consumption of red meat by people in the U.S. in a recent year was normally distributed with a mean μ of 117.8 pounds and a standard deviation σ of 36.3 pounds. Random samples of 24 people are chosen from the U.S. population and sample means \bar{X} are computed.

(a) What is the standard error of the sample means $\sigma_{\bar{X}}$?

(b) What is the probability that the sample mean \bar{X} is greater than 105 pounds?

(c) 92% of samples have a sample average \bar{X} that lies below what value?

(9) A random sample of 47 gas grills has a mean price \bar{X} of \$630.90 and a standard deviation S of \$56.70.

(a) Construct a 95% confidence interval estimate of the population mean μ .

(b) Construct a 98% confidence interval estimate of the population mean μ .

- (10) The grade point averages for 9 randomly selected college students at DeVry are listed below.

0.2	1.4	1.6	1.6	1.8	2.0	3.1	3.1	3.3
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- (a) Compute the sample mean \bar{X} .
- (b) Compute the sample standard deviation S .
- (c) Use this information to determine a 99% confidence interval estimate of the mean GPA at DeVry.

Math 221: Basic Statistics Exam #2C

Week #10

Name: _____

INSTRUCTIONS: You may use a calculator for this exam and a letter-sized study sheet with information written on a single side. You must show all of your work in order to receive full credit. Read each question carefully. Be certain that you have answered the question that was asked. Answers supplied as decimals must be accurate to *at least four decimal digits*.

Problem	Points	Score
1	11	
2	11	
3	11	
4	11	
5	11	
6	11	
7	11	
8	11	
9	11	
10	11	
Total	100	

- (1) The following table shows the results of a survey in which men and women workers ages 25 to 64 were asked if they have at least one month's income set aside for emergencies.

	Men	Women	Total
Less than one month's income	50	56	
One month's income or more	52	47	
Total			

- (a) Fill in the margins of the table.
- (b) Find the probability that a randomly selected worker has less than a month's income set aside?
- (c) **Given** that a randomly selected worker is male, find the probability that he has less than a month's income set aside?
- (d) **Given** that a randomly selected worker has less than a month's income set aside, find the probability that he is male?
- (e) Are the events "having less than a month's income set aside" and "being male" independent or dependent? Explain your answer.

(2) Louis and Rachel both rent videos from the local Blockbuster. Louis returns videos late 20% of the time and Rachel returns videos late 30% of the time. They each rent a video and return them **independently**. What is the probability that

(a) Both return their videos late?

(b) Both return their videos on time?

(c) **At least one** returns the video late?

- (3) A market research company conducts a survey to determine the number of computers (x) owned in households throughout the country. The results are listed as an empirical probability distribution below.

x	p	xp	x^2p
0	0.36		
1	0.31		
2	0.24		
3			
Total			

- (a) Use the rules of probability to fill in the missing value in the second column.
- (b) Fill in the remaining two columns and compute their totals.
- (c) Calculate the mean number of computers per household μ .
- (d) Calculate the variance σ^2 and standard deviation σ .

(4) A surgical technique is performed on seven patients. You are told that there is a 79% chance of success for each patient. Use the binomial distribution to find the probability that the surgery will be successful for

(a) Exactly five patients.

(b) **At least** six patients.

(c) Five **or fewer** patients.

(5) It is estimated that sharks kill an average of 8 people each year worldwide. Use the Poisson distribution to calculate the probability that in a single year

(a) Exactly 7 people will be killed by sharks.

(b) **At most** one person is killed by a shark.

(c) **At least** two people are killed by sharks.

(6) Fill in the following standard normal probabilities or z-values?

(a) $P(Z < 1.88) =$ _____

(b) $P(Z > -2.88) =$ _____

(c) $P(-2.88 < Z < 1.88) =$ _____

(d) $P(Z < \text{_____}) = 0.76$

(7) A study by the Centers for Disease Control and Prevention (CDC) found that women ages 20-29 have a cholesterol level that is normally distributed with a mean μ of 183 and a standard deviation σ of 37.2.

(a) Find the probability that a random woman in this age group will have a cholesterol level above 183.

(b) Find the probability that a random woman in this age group will have a cholesterol level below 235.

(c) 93% of women in this age group have a cholesterol level below what value? (Round your answer to the nearest integer.)

(8) The per capita consumption of red meat by people in the U.S. in a recent year was normally distributed with a mean μ of 118.9 pounds and a standard deviation σ of 35.2 pounds. Random samples of 26 people are chosen from the U.S. population and sample means \bar{X} are computed.

(a) What is the standard error of the sample means $\sigma_{\bar{X}}$?

(b) What is the probability that the sample mean \bar{X} is greater than 105 pounds?

(c) 93% of samples have a sample average \bar{X} that lies below what value?

(9) A random sample of 51 gas grills has a mean price \bar{X} of \$630.90 and a standard deviation S of \$66.70.

(a) Construct a 98% confidence interval estimate of the population mean μ .

(b) Construct a 99% confidence interval estimate of the population mean μ .

- (10) The grade point averages for 9 randomly selected college students at DeVry are listed below.

0.2	1.3	1.4	1.6	1.8	2.3	2.6	3.1	3.3
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- (a) Compute the sample mean \bar{X} .
- (b) Compute the sample standard deviation S .
- (c) Use this information to determine a 90% confidence interval estimate of the mean GPA at DeVry.

Math 221: Basic Statistics Exam #2M

Week #10

Name: _____

INSTRUCTIONS: You may use a calculator for this exam and a letter-sized study sheet with information written on a single side. You must show all of your work in order to receive full credit. Read each question carefully. Be certain that you have answered the question that was asked. Answers supplied as decimals must be accurate to *at least four decimal digits*.

Problem	Points	Score
1	11	
2	11	
3	11	
4	11	
5	11	
6	11	
7	11	
8	11	
9	11	
10	11	
Total	100	

- (1) The following table shows the results of a survey in which men and women workers ages 25 to 64 were asked if they have at least one month's income set aside for emergencies.

	Men	Women	Total
Less than one month's income	51	55	
One month's income or more	51	48	
Total			

- (a) Fill in the margins of the table.
- (b) Find the probability that a randomly selected worker has less than a month's income set aside?
- (c) **Given** that a randomly selected worker is male, find the probability that he has less than a month's income set aside?
- (d) **Given** that a randomly selected worker has less than a month's income set aside, find the probability that he is male?
- (e) Are the events "having less than a month's income set aside" and "being male" independent or dependent? Explain your answer.

(2) Louis and Rachel both rent videos from the local Blockbuster. Louis returns videos late 10% of the time and Rachel returns videos late 20% of the time. They each rent a video and return them **independently**. What is the probability that

(a) Both return their videos late?

(b) Both return their videos on time?

(c) **At least one** returns the video late?

- (3) A market research company conducts a survey to determine the number of computers (x) owned in households throughout the country. The results are listed as an empirical probability distribution below.

x	p	xp	x^2p
0	0.37		
1	0.27		
2	0.17		
3			
Total			

- (a) Use the rules of probability to fill in the missing value in the second column.
- (b) Fill in the remaining two columns and compute their totals.
- (c) Calculate the mean number of computers per household μ .
- (d) Calculate the variance σ^2 and standard deviation σ .

(4) A surgical technique is performed on seven patients. You are told that there is a 57% chance of success for each patient. Use the binomial distribution to find the probability that the surgery will be successful for

(a) Exactly five patients.

(b) **At least** six patients.

(c) Five **or fewer** patients.

(5) It is estimated that sharks kill an average of 6 people each year worldwide. Use the Poisson distribution to calculate the probability that in a single year

(a) Exactly 7 people will be killed by sharks.

(b) **At most** one person is killed by a shark.

(c) **At least** two people are killed by sharks.

(6) Fill in the following standard normal probabilities or z-values?

(a) $P(Z < 1.99) =$ _____

(b) $P(Z > -2.99) =$ _____

(c) $P(-2.99 < Z < 1.99) =$ _____

(d) $P(Z < \text{_____}) = 0.83$

(7) A study by the Centers for Disease Control and Prevention (CDC) found that women ages 20-29 have a cholesterol level that is normally distributed with a mean μ of 183 and a standard deviation σ of 37.2.

(a) Find the probability that a random woman in this age group will have a cholesterol level above 183.

(b) Find the probability that a random woman in this age group will have a cholesterol level below 247.

(c) 94% of women in this age group have a cholesterol level below what value? (Round your answer to the nearest integer.)

(8) The per capita consumption of red meat by people in the U.S. in a recent year was normally distributed with a mean μ of 119.6 pounds and a standard deviation σ of 34.1 pounds. Random samples of 29 people are chosen from the U.S. population and sample means \bar{X} are computed.

(a) What is the standard error of the sample means $\sigma_{\bar{X}}$?

(b) What is the probability that the sample mean \bar{X} is greater than 105 pounds?

(c) 94% of samples have a sample average \bar{X} that lies below what value?

(9) A random sample of 72 gas grills has a mean price \bar{X} of \$630.90 and a standard deviation S of \$26.70.

(a) Construct a 90% confidence interval estimate of the population mean μ .

(b) Construct a 98% confidence interval estimate of the population mean μ .

- (10) The grade point averages for 9 randomly selected college students at DeVry are listed below.

0.2	1.3	1.4	1.6	1.8	2.6	3.1	3.1	3.3
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- (a) Compute the sample mean \bar{X} .
- (b) Compute the sample standard deviation S .
- (c) Use this information to determine a 95% confidence interval estimate of the mean GPA at DeVry.