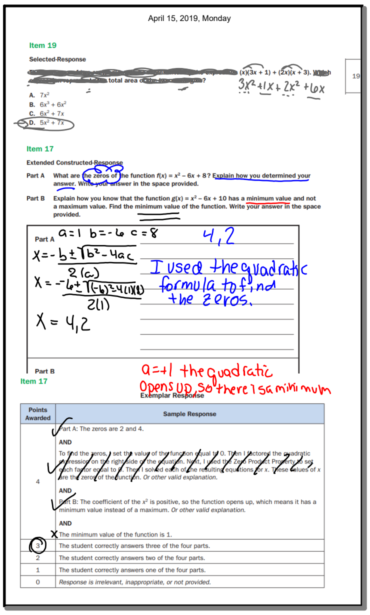


April 15, 2019, Monday

Item 19

Selected-Response

A. $7x^2$
B. $6x^2 + 6x^2$
C. $6x^2 + 7x$
D. $5x^2 + 7x$

Item 17

Extended Constructed-Response

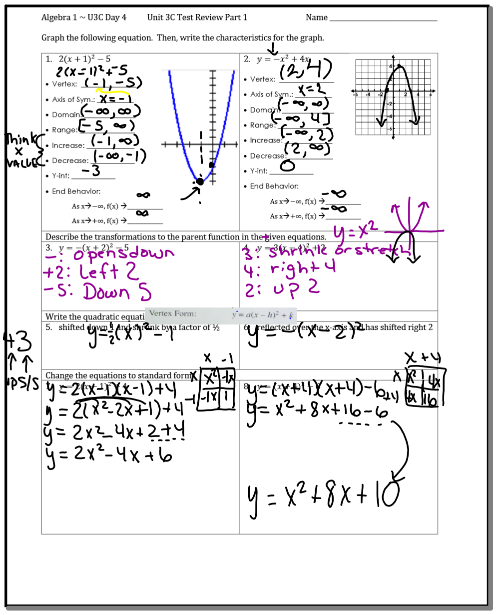
Part A What are the zeros of the function $f(x) = x^2 - 6x + 8$? Explain how you determined your answer. Write your answer in the space provided.

Part B Explain how you know that the function $g(x) = x^2 - 6x + 10$ has a minimum value and not a maximum value. Find the minimum value of the function. Write your answer in the space provided.

Item 17

Exemplar Response

Points Awarded	Sample Response
4	Part A: The zeros are 2 and 4. AND To find the zeros, I set the value of the function equal to 0. Then I factored the quadratic expression on the right side of the equation. Next, I used the Zero Product Property to set each factor equal to 0. Then I solved each of the resulting equations for x. These values of x are the zeros of the function. *Or other valid explanation.* AND Part B: The coefficient of the x^2 is positive, so the function opens up, which means it has a minimum value instead of a maximum. *Or other valid explanation.* AND The minimum value of the function is 1.
3	The student correctly answers three of the four parts.
2	The student correctly answers two of the four parts.
1	The student correctly answers one of the four parts.
0	*Response is irrelevant, inappropriate, or not provided.*



Algebra 1 ~ U3C Day 4 Unit 3C Test Review Part 1 Name ______

Graph the following equation. Then, write the characteristics for the graph.

1. $2(x+1)^2 - 5$
2. $y = -x^2 + 4x$

- Vertex:
- Axis of Sym.:
- Domain:
- Range:
- Increase:
- Decrease:
- Y-Int:
- End Behavior:

As $x \to -\infty$, $f(x) \to$
As $x \to +\infty$, $f(x) \to$

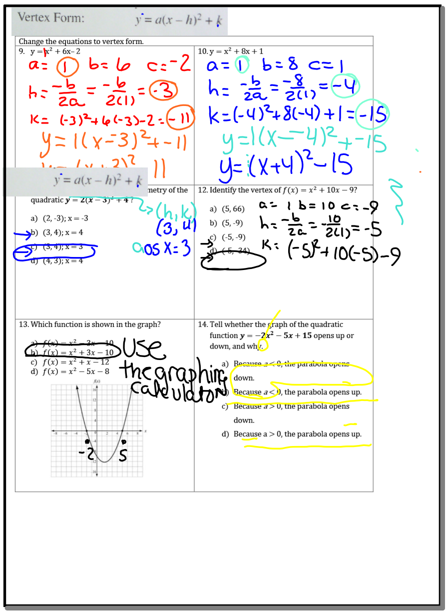
Describe the transformations to the parent function in the given equations.

3. $y = -(x+2)^2 - 5$

Write the quadratic equation

5. shifted down 1 and shrink by a factor of ½
6. reflected over the x-axis and has shifted right 2

Change the equations to standard form.



Vertex Form: $y = a(x-h)^2 + k$

Change the equations to vertex form.

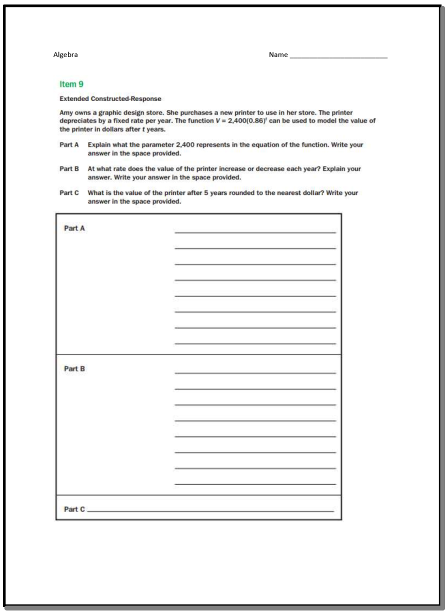
9. $y = x^2 + 6x - 2$
10. $y = x^2 + 8x + 1$

11. ... axis of symmetry of the quadratic $y = 2(x-3)^2 + 4$?
a) (2, -3); x = -3
b) (3, 4); x = 4
c) (3, 4); x = 3
d) (4, 3); x = 4

12. Identify the vertex of $f(x) = x^2 + 10x - 9$?
a) (5, 66)
b) (5, -9)
c) (-5, -9)
d) (-5, -34)

13. Which function is shown in the graph?
a) $f(x) = x^2 - 3x - 10$
b) $f(x) = x^2 + 3x - 10$
c) $f(x) = x^2 + x - 12$
d) $f(x) = x^2 - 5x - 8$

14. Tell whether the graph of the quadratic function $y = -2x^2 - 5x + 15$ opens up or down, and why.
a) Because $a < 0$, the parabola opens down.
b) Because $a < 0$, the parabola opens up.
c) Because $a > 0$, the parabola opens down.
d) Because $a > 0$, the parabola opens up.



Algebra Name ______

Item 9

Extended Constructed-Response

Amy owns a graphic design store. She purchases a new printer to use in her store. The printer depreciates by a fixed rate per year. The function $V = 2{,}400(0.86)^t$ can be used to model the value of the printer in dollars after t years.

Part A Explain what the parameter 2,400 represents in the equation of the function. Write your answer in the space provided.

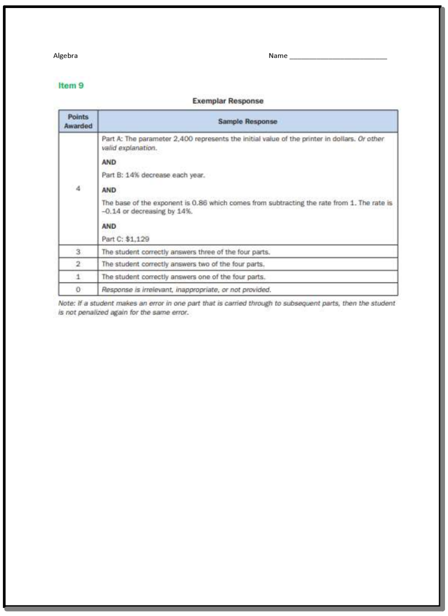
Part B At what rate does the value of the printer increase or decrease each year? Explain your answer. Write your answer in the space provided.

Part C What is the value of the printer after 5 years rounded to the nearest dollar? Write your answer in the space provided.

Part A

Part B

Part C



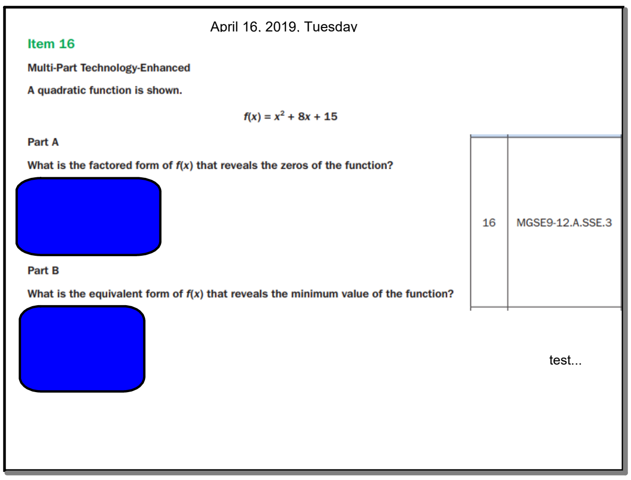
Algebra Name ______

Item 9

Exemplar Response

Points Awarded	Sample Response
4	Part A: The parameter 2,400 represents the initial value of the printer in dollars. *Or other valid explanation.* AND Part B: 14% decrease each year. AND The base of the exponent is 0.86 which comes from subtracting the rate from 1. The rate is −0.14 or decreasing by 14%. AND Part C: $1,129
3	The student correctly answers three of the four parts.
2	The student correctly answers two of the four parts.
1	The student correctly answers one of the four parts.
0	*Response is irrelevant, inappropriate, or not provided.*

Note: If a student makes an error in one part that is carried through to subsequent parts, then the student is not penalized again for the same error.



April 16, 2019, Tuesday

Item 16

Multi-Part Technology-Enhanced

A quadratic function is shown.

$f(x) = x^2 + 8x + 15$

Part A

What is the factored form of $f(x)$ that reveals the zeros of the function?

Part B

What is the equivalent form of $f(x)$ that reveals the minimum value of the function?

16	MGSE9-12.A.SSE.3

test...

Item 1

Which set of data points could be modeled by a decreasing linear function?

A. {(0, 0), (1, 8), (2, 15), (3, 22), (4, 30)}
B. {(0, 5), (1, 6), (2, 10), (3, 16), (4, 28)}
C. {(0, 50), (1, 42), (2, 33), (3, 25), (4, 16)}
D. {(0, 64), (1, 60), (2, 52), (3, 39), (4, 22)}

Item 2

Use these functions to answer this question.

$P(x) = x^2 - x - 6$

$Q(x) = x - 3$

What is $P(x) - Q(x)$?

A. $x^2 - 3$
B. $x^2 - 9$
C. $x^2 - 2x - 3$
D. $x^2 - 2x - 9$

Item 3

The total daily expenses to operate Sheila's pie bakery are the cost of salaries and ingredients. Sheila has four employees, and she pays each worker a daily rate. On average, it costs the same amount of money to make each pie. This expression shows the total daily expenses for Sheila's bakery to make x pies.

$4(75) + \$0.50x$

What does the term 4(75) represent?

A. The amount of money Sheila must pay her employees per day.
B. The number of pies Sheila must sell per day.
C. The total cost of expenses per pie.
D. The amount of money customers pay per pie.

Item 4

Which function represents the data in the table?

x	3	6	10	15
y	2.5	4	6	8.5

A $f(x) = 2x + 1$
B $f(x) = \frac{x}{2} - 1$
C $f(x) = 2x - 1$
D $f(x) = \frac{x}{2} + 1$

Item 5

What is the solution to this system of equations?

$x - 3y = 1$
$x - 2y = 6$

A (−4, −5)
B (−2, −1)
C (4, 1)
D (16, 5)

Item 6

Information about the costs of three catering companies is shown in this table.

Catering Company Costs

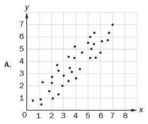
Acme Catering Company	Best Foods Company	Creative Catering Company
$6 per person plus a flat $100 time and equipment charge	$8 per person plus a flat $40 time and equipment charge	$10 per person charge with no other fees

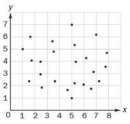
Gavin can spend no more than $300 on catering. What is the greatest number of people he can invite using one of the three caterers?

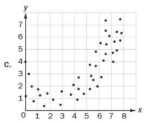
A. 30
B. 32
C. 33
D. 37

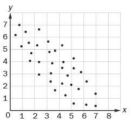
Item 7

Which set of data could be BEST modeled by a quadratic function?

A.


B.


C.


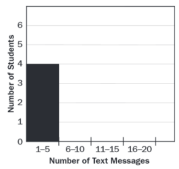
D.


Item 8

This list shows the number of text messages each student in a group sent in one day.

16, 2, 8, 5, 3, 20,
15, 4, 9, 16, 19, 17

The students are creating this histogram to show their data.



What should be the height of the bar for 6–10 text messages?

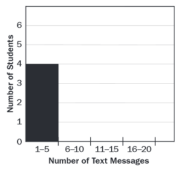
A. 1
B. 2
C. 4
D. 5

Item 8

This list shows the number of text messages each student in a group sent in one day.

16, 2, 8, 5, 3, 20,
15, 4, 9, 16, 19, 17

The students are creating this histogram to show their data.



What should be the height of the bar for 6–10 text messages?

A. 1
B. 2
C. 4
D. 5

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
1	MGSE9-12S.ID.6a	1	C	The correct answer is choice (C) {(0, 50), (1, 42), (2, 33), (3, 25), (4, 16)}. This set of data points is the only one from the list that could be modeled by a decreasing linear function, which has a negative value for a in the linear function formula: $f(x) = ax + b$. Choices (A), (B), and (D) are incorrect because the data points do not correspond to a function with a negative value for a in the linear function formula.
2	MGSE9-12A.APR.1	2	C	The correct answer is choice (C) $x^2 - 2x - 3$. This indicates a correct calculation of $P(x) - Q(x) = x^2 - x - 6 - (x - 3) = x^2 - x - 6 - x + 3 = x^2 - 2x - 3$. Choice (A) is incorrect due to a sign error on the term x. Choice (B) is incorrect due to adding $P(x)$ and $Q(x)$. Choice (D) is incorrect due to a sign error on the number 3.
3	MGSE9-12A.SSE.1a	2	A	The correct answer is choice (A) The amount of money Sheila must pay her employees per day. Choice (B) is incorrect because the number of pies Sheila must sell per day is represented by x. Choice (C) is incorrect because the total cost of expenses per pie is represented by the value of the entire expression. Choice (D) is incorrect because the amount of money customers pay per pie is not represented in the expression.
4	MGSE9-12F.BF.1	2	D	The correct answer is choice (D) $f(x) = \frac{x}{2} + 1$. When the x-values in the table are substituted for x in this function, the result is equal to the corresponding y-value. Choice (A) is incorrect because the function indicates multiplication of 2 and x instead of division of x by 2. Choice (B) is incorrect because the function indicates subtraction of 1 instead of addition of 1. Choice (C) is incorrect because the function indicates multiplication of 2 and x instead of division of x by 2 and indicates subtraction of 1 instead of addition of 1.

Item	Standard/ Element	DOK Level	Correct Answer	Explanation
5	MGSE9-12A.REI.6	2	D	The correct answer is choice (D) (16, 5). When the values of the coordinate pair are substituted into the system of equations, both sides are equal for both equations. As such, the coordinate pair represents a solution to the system of equations. Choices (B) and (C) are incorrect because the values of the coordinate pair, when substituted into the system of equations, result in an incorrect solution for the second equation. Choice (A) is incorrect because the values of the coordinate pair, when substituted into the system of equations, result in an incorrect solution for the first equation.
6	MGSE9-12A.CED.1	3	C	The correct answer is choice (C) 33. At $6 per person, and with a $100 flat service charge added, Acme Catering Company can provide services for 33 people at a cost of $298. Choice (A) is incorrect because it is the number from the Creative Catering Company, but not the largest number possible. Choice (B) is incorrect because it is the number from the Best Foods Company, but not the largest number possible. Choice (D) is incorrect because the student selects the highest number without basing the response on the context provided.
7	MGSE9-12S.ID.6a	2	C	The correct answer is choice (C). The data in the graph represents a quadratic trend. The graphs in (A) and (D) represent a correlation to linear trends. The graph in (B) represents data with no clear correlation.
8	MGSE9-12S.ID.1	2	B	The correct answer is choice (B) 2. Only 2 students sent 6–10 text messages. Choices (A), (C), and (D) are incorrect because the student either made a counting mistake or looked at the numbers for 11–15 or 16–20 text messages instead of those for 6–10.
9	MGSE9-12A.REI.3	3	N/A	*See next page for scoring rubric and responses.*
10	MGSE9-12F.LE.5	3	N/A	*See next page for scoring rubric and responses.*

Below are scoring rubrics and sample exemplar responses for items 9 & 10.

Item 9

Scoring Rubric

Points	Description
2	The response achieves the following: • student gets Part A AND Part B correct
1	The response achieves the following: • student gets Part A OR Part B correct
0	The response achieves the following: • student gets neither Part A nor Part B correct

Exemplar Response

Points Awarded	Response
2	Part A: Jill did not invert the inequality sign in step 4 when dividing by a negative number. AND Part B: $-3x < 4x + 8$ $-7x < 8$ $x > \frac{8}{-7}$
1	Part A: Jill did not invert the inequality sign in step 4 when dividing by a negative number. OR Part B: $-3x < 4x = 8$ $-7x < 8$ $x > \frac{8}{-7}$
0	*Student does not produce a correct response or a correct process.*

Item 10

Scoring Rubric

Points	Description
4	The response achieves the following: Student demonstrates a complete and thorough understanding of interpreting the parameters in a linear function in terms of a context. Award 4 points for a student response that contains all of the following elements: • Part A: $2,000 • Part B: 0.5% per month • Part C: 22 months • Part D: $2,231.94. Since it will take 22 months for the student council to save enough money, the first function can be solved for $v(22)$, which equals 2,231.94.
3	The response achieves the following: Student demonstrates nearly complete understanding of interpreting the parameters in a linear function in terms of a context. Award 3 points for a student response that contains any 3 of the following elements: • Part A: $2,000 • Part B: 0.5% per month • Part C: 22 months • Part D: $2,231.94. Since it will take 22 months for the student council to save enough money, the first function can be solved for $v(22)$, which equals 2,231.94. **Scoring Note:** If an error is made in one of these response elements, future response elements based on that should count as correct based upon the previous error. For example, if the student indicates 8 months as the response to Part C and computes a response to Part D that is correct for $v(8)$, then the Part D element should be scored as correct.
2	The response achieves the following: Student demonstrates partial understanding of interpreting the parameters in a linear function in terms of a context. Award 2 points for a student response that contains any 2 of the following elements: • Part A: $2,000 • Part B: 5% per month (see "Note for Educators" below) • Part B: 0.5% (with or without "rate" duration included) • Part C: 22 months • Part D: $2,231.94 **Scoring Note:** If an error is made in one of these response elements, future response elements based on that should count as correct based upon the previous error. For example, if the student indicates 8 months as the response to Part C and computes a response to Part D that is correct for $v(8)$, then the Part D element should be scored as correct. **Note for Educators:** Higher score levels reflect higher levels of precision and accuracy within the response. At lower score levels, incorrect responses which indicate partial understanding of the concepts under assessment may be awarded points. In this example, the two possible responses for Part B represent cases where the student is demonstrating a partial understanding of how to interpret the number 1.005 within this context, so students who commit these errors will receive partial credit in their responses at the 1- and 2-point levels.

Points	Description
1	The response achieves the following: Student demonstrates minimal understanding of interpreting the parameters in a linear function in terms of a context. Award 1 point for a student response that contains any 1 of the following elements: • Part A: $2,000 • Part B: 5% per month (See "Note for Educators" below) • Part B: 0.5% (with or without "rate" duration included) • Part B: 1.005% per month • Part C: 22 months • Part D: $2,231.94 **Scoring Note:** If an error is made in one of these response elements, future response elements based on that should count as correct based upon the previous error. For example, if the student indicates 8 months as the response to Part C and computes a response to Part D that is correct for $v(8)$, then the Part D element should be scored as correct. **Note for Educators:** Higher score levels reflect higher levels of precision and accuracy within the response. At lower score levels, incorrect responses which indicate partial understanding of the concepts under assessment may be awarded points. In this example, the two possible responses for Part B represent cases where the student is demonstrating a partial understanding of how to interpret the number 1.005 within this context, so students who commit these errors will receive partial credit in their responses at the 1- and 2-point levels.
0	The response achieves the following: The student demonstrates limited to no understanding of interpreting the parameters in a linear function in terms of a context.

Exemplar Response

Points Awarded	Response
4	Part A: $2,000 Part B: 0.5% per month Part C: 22 months Part D: $2,231.94
3	Part A: $2,000 Part B: 5% per month Part C: 22 months Part D: $2,231.94
2	Part A: $2,000 Part B: 5% per month Part C: 22 months Part D: $2,000
1	Part A: $2,000 Part B: 5% Part C: 20 months Part D: $4,000
0	Part A: $250 Part B: 1.005% Part C: 5 Part D: $2,000

EOC Practice Test Prep Bubble Sheet Answer Key

Student Name: _____

1 Ⓐ Ⓑ Ⓒ Ⓓ
2 Ⓐ Ⓑ Ⓒ Ⓓ
3 Ⓐ Ⓑ Ⓒ Ⓓ
4 Ⓐ Ⓑ Ⓒ Ⓓ
5 Ⓐ Ⓑ Ⓒ Ⓓ
6 Ⓐ Ⓑ Ⓒ Ⓓ
7 Ⓐ Ⓑ Ⓒ Ⓓ
8 Ⓐ Ⓑ Ⓒ Ⓓ

9 *Place response to question 9 part A below:*

Place response to question 9 part B below:

Algebra 1

Answer parts A, B, C, & D for item number 10 below:

Part A:

Part B:

Part C:

Part D:

16

April 17, 2019, Wednesday

14	MGSE
15	MGSE

Item 14

Selected-Response

Which value is an irrational number?

A. $4+\sqrt{7}$

B. $\sqrt{2}\sqrt{8}$

C. $\frac{\sqrt{3}\sqrt{12}}{5}$

D. $\sqrt{3}-\sqrt{3}$

Item 15

Selected-Response

The table defines a quadratic function.

x	y
−1	5
0	1
1	−1
3	1

What is the average rate of change between x = –1 and x = 1?

A. undefined

B. $-\frac{1}{3}$

C. –3

D. –4

Algebra 1 ~ U6 Day 1 Statistics Vocabulary Notes

Terms	Describe	Example
Measures of Center		Mean Median Mode
Mean	The _____ of a data set, found by adding all values and dividing by the number of data points	**Find the mean:** 5 + 4 + 2 + 6 + 3 =
Median	The _____ value of a data set; ___ of the data is less than this value, and ___ is greater than it	65, 65, 70, 75, 80, 80, 85, 90, 95, 100
Measures of Variability (spread)		Range Interquartile Range (IQR)
Range	The _____ between the _____ and _____ numbers in the data set.	65, 65, 70, 75, 80, 80, 85, 90, 95, 100 Range = highest # – lowest # in the dataset Range =
Outlier	A data value that is much _____ than or much _____ than the rest of the data in a data set.	
First Quartile	The value that identifies the _____ 25% of the data; the median of the _____ half of the data set; written as Q_1.	median of all data, second quartile 65, 65, 70, 75, 80, 80, 85, 90, 95, 100 median of lower part, first quartile
Third Quartile	Value that identifies the _____ 25% of the data; the median of the _____ half of the data set; 75% of all data is less than this value; written as Q_3.	median of all data, second quartile 65, 65, 70, 75, 80, 80, 85, 90, 95, 100 median of upper part, third quartile

Interquartile Range	The _____ between the third and first quartiles; 50% of the data is contained within this range.	**IQR = Third Quartile (Q_3) – First Quartile (Q_1)** **IQR from above =**
Box Plot	A plot showing the _____, _____, _____, and _____ of a data set; the middle 50% of the data is indicated by a box.	Lower Quartile (Q_1), Upper Quartile (Q_3), Median, Minimum, Maximum 0 10 20 30 40 50 60 70
Dot Plot	A _____ plot that shows the number of times a response occurred in a data set, where each data value is represented by a dot.	
Histogram	A _____ plot that shows the number of times a response or range of responses occurred in a data set. The bars are _____ and will be the _____ across the chart.	0 20 40 60 80 100 120 140

Statistical Measures Notes

1. Given the following data for temperatures in the first two weeks of February 2014:
51, 44, 28, 25, 17, 71, 62, 32, 37, 54, 47, 31, 60, 39

Mean:	Min:	Max:
Q1:	Median:	Q3:
Box Plot:		

Statistics Measures & Graphs Practice

1) Use the box and whisker plot for questions a – i.

Height in inches

58 59 60 61 62 63 64 65 66

a) What is the median?

b) What is the lower quartile?

c) What is the upper quartile?

d) What are the upper and lower extremes (maximum and minimum)?

e) What is the range?

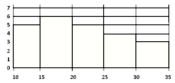
f) What is the interquartile range?

g) What percentage of data is located between 60in and 64in?

h) What percentage of data is located below 64in?

i) What percentage of data is located below 60in?

2) Analyze the given histogram which displays the ACT composite score of several randomly chosen students.



a) How many students are represented by the histogram?

b) How many student scores fall between 15 and 25?

c) How many students have scores less than 30?

d) How many students have scores between 10 and 15 and between 20 and 25?

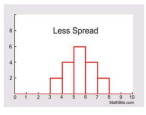
e) Can you determine how many students scored a 20? Why or why not?

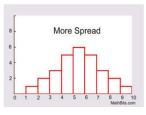
Analyzing Data Sets Notes

Focus on Four Features:

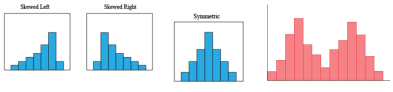
- **Center** – Graphically, the center of a distribution is the point where about _____ of the data is on either side.
- **Spread** – The spread refers to the _____ of the data.
- **Shape** – The shape of a data distribution focuses on _____ and _____
- **Unusual Features** – Such as _____ or _____

Spread – The _____ of the data

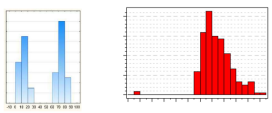




Shape – Described by _____, _____, and _____



Unusual Features – The most common are _____ and _____



Statistical Measures Unit 6 Day 1 Homework

Name: _____

1. Given the following data for temperatures in the first two weeks of February 2014.
51, 44, 28, 25, 17, 71, 62, 32, 37, 54, 47, 31, 60, 39

a) Calculate the following:

Mean_____ Min_____ Max_____ Range _____

Q1_____ Median_____ Q3_____ IQR _____

Box Plot:

2. Now look at the temperatures for the first 2 weeks of February 2013
30, 46, 50, 27, 52, 43, 47, 53, 58, 28, 55, 42, 36, 38

a) Calculate the following:

Mean_____ Min_____ Max_____ Range _____

Q1_____ Median_____ Q3_____ IQR _____

Box Plot:

b) Which year has a higher mean? What does that tell us?

c) Which year has a higher median? What does that tell us?

d) Which year's temperatures were more variable? How do you know?

e) If the temperature drops to 0 for 2 days in 2014, how does that affect the data?

f) Which measure of central tendency is most affected by the drop in temperature?

Practice:

3. Kirsten plays softball in the spring. Each game, she records the number of times she reaches first base without being called out.

Game	Number of times at first
1	5
2	1
3	2
4	0
5	2
6	2
7	4
8	4
9	0

a. What was Kirsten's mean and median scores?

b. What is the range of Kirsten's data?

4. The following are scores from a college basketball tournament.

108, 107, 100, 120, 63, 119, 118

a. Find the mean and median scores.

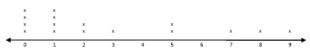
b. What do you notice about the mean and median scores? Compare them.

c. What has caused the mean and median scores to differ?

5. Find the median, the first (lower) quartile, the third (upper) quartile, and the interquartile range of the following data. Then draw a box plot.

40, 62, 47, 68, 12, 78, 49, 65, 49

3. Analyze the given dot plot which displays the number of home runs by each of the members of the Atlanta Braves team during the month of April and answer the questions accordingly.



b. How many players are on the team?

c. How many players hit more than 2 home runs?

d. How many players hit at least 1 home run?

e. How many players hit more than 1 and fewer than 9 home runs?

f. How many players scored more than 9 home runs?

g. How many players hit more than 1 and fewer than 5 home runs?

h. How many players scored less than 3 home runs?

i. Compute the mean of the data set (average homeruns per player).

j. Determine the 5 number summary of homeruns (Min, Q_1, Median, Q_3, Max).

k. Calculate the IQR of the homeruns.

4. Mr. Corson's recent science test had the following scores:
90,95,100,70,85,65,90,80,65,70,75,80,85,80,60,80,75,85

Construct a box-and-whisker plot.

April 18, 2019, Thursday

Item 11

Selected-Response

A scientist studied the relationship between the number of trees, x, per acre and the number of birds, y, per acre in a neighborhood. She modeled the relationship with a scatter plot and used the equation $y = 4 + 6x$ for the regression line. What is the meaning of the slope and y-intercept of this regression line?

A. The slope is 6. This means that the average number of birds per acre in an area with no trees is 6. The y-intercept is 4. This means that for every 1 additional tree, she can expect an average of 4 additional birds per acre.
B. The slope is 4. This means that for every 1 additional tree, she can expect an average of 4 additional birds per acre. The y-intercept is 6. This means that the average number of birds per acre in an area with no trees is 6.
C. The slope is 6. This means that for every 1 additional tree, she can expect an average of 6 additional birds per acre. The y-intercept is 4. This means that the average number of birds per acre in an area with no trees is 4.
D. The slope is 4. This means that the average number of birds per acre in an area with no trees is 4. The y-intercept is 6. This means that for every 1 additional tree, she can expect an average of 6 additional birds per acre.

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Item 12

Selected-Response

A random group of high school students was surveyed. Each student was asked whether it should be mandatory for all high school students to participate in a sport. The results are partially summarized in the two-way table.

	Agree	Disagree	No Opinion	Total
Freshman	53	12	7	
Sophomore	65	37	2	104
Junior	18	42	12	
Senior	56	67	4	
Total		158		375

What percentage is closest to the number of students in the freshman group who agree that it should be mandatory for all high school students to participate in a sport?

A. 14.1%
B. 22.6%
C. 53%
D. 73.6%

12

Algebra 1 ~ U6 Day 2 Linear Regression Notes

A little vocab...

- The _____ is the line that lies as close as possible to all the data points.
- _____ is a method used to find the equation of the best fitting line or curve.

Line of Best Fit by Hand:

1. The environment club is interested in the relationship between the number of canned beverages sold in the cafeteria and the number of cans that are recycled. The data they collected are listed in this chart.

Beverage Can Recycling								
Number of Canned Beverages Sold	18	15	19	8	10	13	9	14
Number of Cans Recycled	8	6	10	6	3	7	5	4

a) Find the line of best fit. Round to two decimal places if needed. Also, identify the correlation coefficient and type of correlation.

b) Find and interpret the slope of the line of best fit.

c) How many cans would be recycled if 16 cans were sold?

2. The table shows the total outstanding consumer debt (excluding home mortgages) in billions of dollars in selected years. (Data is from the Federal Reserve Bulletin.)

Year, t	1985	1990	1995	2000	2003
Consumer Debt	585	789	1096	1693	1987

a) Find the line of best fit. Round to two decimal places. Also, identify the correlation coefficient and type of correlation.

b) Find and interpret the slope of the line of best fit.

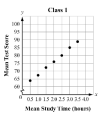
c) Find the approximate consumer debt in 1998.

d) Find the approximate consumer debt in 2008.

Correlation Notes

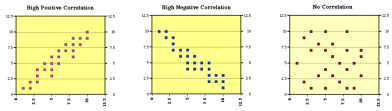
Correlation

A _____ is often used to present bivariate **quantitative** data. Each variable is represented on an axis and the axes are labeled accordingly.



A scatter plot displays data as points on a grid using the associated numbers as coordinates or ordered pairs (x, y). The way the points are arranged by themselves in a scatter plot may or may not suggest a relationship between the two variables. For instance, by reading the graph below, do you think there is a relationship between the hours spent studying and exam grades?

If y tends to increase as x increases, then the data have _____ correlation.
If y tends to decrease as x increases, then the data have _____ correlation.



A correlation coefficient, denoted by r, is a number from -1 to 1 that measures how well a line fits a set of data pairs (x, y).

- If r is near 1: _____.
- If r is near -1, _____.
- If r is near 0, _____.

Practice Problems:

For each scatter plot, tell whether the data have a positive correlation, a negative correlation, or no correlation. Then, tell whether the correlation is closest to -1, -0.5, 0, 0.5, or 1.

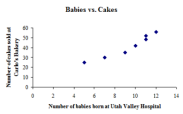
3. Positive, negative, or no correlation?
   a. Amount of exercise and percent of body fat _____
   b. A person's age and the number of medical conditions they have _____
   c. Temperature and number of ice cream cones sold _____
   d. The number of students at Hillgrove and the number of dogs in Atlanta _____
   e. Age of a tadpole and the length of its tail _____

Causation Notes

When a scatter plot shows a correlation between two variables, even if it's a strong one, there is *not necessarily a cause-and-effect relationship.* Both variables could be related to some third variable that causes the apparent correlation. Also, an apparent correlation simply could be the result of chance.

Example 1: During the month of June the number of new babies born at the Utah Valley Hospital was recorded for a week. Over the same time period, the number of cakes sold at Carlo's Bakery in Hoboken, New Jersey was also recorded. What can be said about the correlation? Is there causation? Why or why not?

Number of babies born	Number of cakes sold
5	25
7	30
9	35
10	42
11	48
11	52
12	56



Example 2: Mr. Jones gave a math test to all the students in his school. He made the startling discovery that the taller students did better than the short ones. His Causation Statement: *As your height increases, so does your math ability.*
What can be said about the correlation? Is there causation? Why or why not?

Example 3: In this present economy families are trying to find ways to save money Families might be thinking about not eating out to spend less money. Causation Statement: *The more you eat out, the more money you spend at restaurants.*
What can be said about the correlation? Is there causation? Why or why not?

Algebra 1 ~ U6 Day 2 Linear Regression HW Name _____

3. The table below shows the number of deaths per 100,000 people from heart disease in selected years. (Data is from the U.S. National Center for Health Statistics.)

Year	1960	1970	1980	1990	2000	2002
Deaths	559	483	412	322	258	240

a) Find the line of best fit. Round to two decimal places. Also, identify the correlation coefficient and type of correlation.

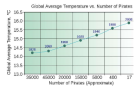
b) Find and interpret the slope of the line of best fit.

c) Find the approximate number of deaths due to heart disease in 1995.

d) Find the approximate number of deaths due to heart disease in 2008.

Correlation HW

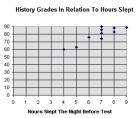
1. From the information given,
   a. Determine if the correlation is positive, negative or none.



   b. Estimate the correlation coefficient.

   c. Is there causation? Why or why not?

2. A history teacher asked her students how many hours of sleep they had the night before a test. The data above shows the number of hours the student slept and their score on the exam. The graph is a scatter plot from the given data.

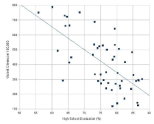


   a. Determine if the correlation is positive, negative, or none.

   b. Estimate the correlation coefficient.

   c. Is there causation? Would this information affect your behavior the night before a test?

3. The following chart shows violent crime rates compared to high school graduation for all fifty states.
   a. Determine if the correlation is positive, negative, or none.



   b. Estimate the correlation coefficient.

   c. Is this an illustration of cause and effect, or are these two variables simply correlated?

Stats In-Class Assignment Name _____

Vocabulary: Matching

___ 1. Mean
___ 2. Median
___ 3. Mode
___ 4. Measures of center
___ 5. Range
___ 6. Histogram
___ 7. Box plot
___ 8. Measures of variability
___ 9. First Quartile
___ 10. Third Quartile
___ 11. Interquartile Range
___ 12. Dot plot
___ 13. Outlier

A. A number that is beyond the data points that are given
B. Add all the data points together & divide by the number of data points in the set
C. Maximum - Minimum
D. The number that occurs the most
E. The median of the lower half of the data
F. Mean, Median, and Mode
G. A bar graph where the bars must be touching and equally spaced
H. The graph that contains the 5-number summary (Min, Q1, Median, Q3, & Max)
I. When arranged from least to greatest, the middle number
J. Interquartile range and Range
K. The median of the upper half of the data
L. Third Quartile – First Quartile
M. A graph that uses dots to represent the frequency of data points

MULTIPLE CHOICE

14. How much data lies between Q_1 and Q_3.
A. 25% B. 50% C. 75% D. 100%

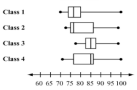
15. Which of the following is one of the 5 values needed to make a box-and-whisker plot?
A. Mean B. Median C. Mode D. Range

16. The table shows the sizes, in square feet, of a sample of eight houses from a neighborhood. What is the **range** of the sizes of the house? (Hint: Range = Max – Min)

House	1	2	3	4	5	6	7	8
Size	1025	1288	2344	988	12,985	1509	1077	2415

A. 2957.75 B. 1394 C. 1348.5 D. 11,997

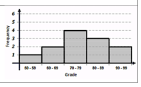
For 17 & 18, Mr. Murray recorded the pulse rates for each of the students in his classes after the students had climbed a set of stairs. He displayed the results, by class, using the box plots shown.



17. Which class had the **highest upper (third) quartile**?
A. Class 1 C. Class 2
B. Class 3 D. Class 4

18. Which class had the **lowest IQR**?
A. Class 1 C. Class 2
B. Class 3 D. Class 4

19. Consider the following histogram that shows the scores from a math test. How many students did not pass the test (their grade was below a 70)?
A. 0 B. 1 C. 2 D. 3



20. The Sharks have played 5 basketball games this season. Their scores are 60, 63, 65, 65, 67. If they only scor points in their next game, what will happen to their **median** score?
A. It will not change. B. It will decrease by 1.
C. It will increase by 1. D. It will decrease by 2.

21. A reading teacher recorded the number of pages read in an hour by each of her students. The numbers are shown below.
39, 43, 44, 44, 45, 49, 49, 50, 51
For this data, which summary statistic is **NOT** correct?
A. The minimum is 39.
B. The lower quartile is 44
C. The median is 45.
D. The maximum is 51.

For 22-26, use the accompanying box-and-whisker plot represents the scores earned on a math test to answer the questions.

22. What is the median score?
A. 75 B. 70 C. 85 D. 77

23. What score represents the first quartile?
A. 55 B. 70 C. 100 D. 75

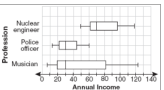
24. What statement is *not* true about the box and whisker plot shown?
A. 75 represents the mean score C. 85 represents the 3rd quartile
B. 100 represents the maximum score D. 55 represents the minimum score

25. A score of an 85 on the box-and-whisker plot shown refers to:
A. the third quartile B. the median C. the maximum score D. the mean

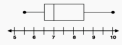
26. What percentage of data falls between the Minimum and the Median?
A. 25% B. 50% C. 75% D. 100%

27. Which of the following data sets has a median of 7.5?
A. {6, 7, 8, 9, 10} B. {1, 3, 7, 10, 14} C. {3, 5, 7, 8, 10, 14} D. {2, 7, 9, 11, 14, 17}

28. The accompanying box-and-whisker plots can be used to compare the annual incomes of three professions. Based on the box-and-whisker plots, which statement is true?
A. The median income for nuclear engineers is greater than the income of all musicians.
B. The median income for police officers and musicians is the same.
C. All nuclear engineers earn more than all police officers.
D. A musician will eventually earn more than a police officer.



29. What is the median of the data set used to create the box plot below?

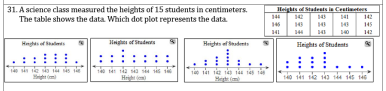


a. 5.5 c. 7
b. 6.5 d. 8.5

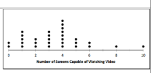
30. Which of the following data sets, given in ascending order, has the greatest range?
A. {3, 4, 7,10,18} B. {-2, 5, 8,11, 26} C. {65, 66, 70, 72} D. {-5, - 2, 4, 7,10}

31. A science class measured the heights of 15 students in centimeters. The table shows the data. Which dot plot represents the data.

Heights of Students in Centimeters				
146	142	143	141	142
146	143	143	143	145
141	144	143	140	142

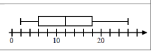


32. A local marketing company did a survey of 30 households to determine how many devices the household contained that family members watched video on (i.e. TV's, tablets, phones, etc). The dot plot of the responses is shown below.



How many households have three devices capable of showing video on them?
A. 1 B. 7 C. 2 D. 5

33. What is the interquartile range of the data set represented in the box plot shown below?
A. 2 B. 6 C. 12 D. 24



April 19 2019, Friday

Item 9

Extended Constructed-Response

Amy owns a graphic design store. She purchases a new printer to use in her store. The printer depreciates by a fixed rate per year. The function $V = 2{,}400(0.86)^t$ can be used to model the value of the printer in dollars after t years.

Part A Explain what the parameter 2,400 represents in the equation of the function. Write your answer in the space provided.

Part B At what rate does the value of the printer increase or decrease each year? Explain your answer. Write your answer in the space provided.

Part C What is the value of the printer after 5 years rounded to the nearest dollar? Write your answer in the space provided.

Item 9

Exemplar Response

Points Awarded	Sample Response
4	Part A: The parameter 2,400 represents the initial value of the printer in dollars. *Or other valid explanation.* **AND** Part B: 14% decrease each year. **AND** The base of the exponent is 0.86 which comes from subtracting the rate from 1. The rate is –0.14 or decreasing by 14%. **AND** Part C: $1,129
3	The student correctly answers three of the four parts.
2	The student correctly answers two of the four parts.
1	The student correctly answers one of the four parts.
0	*Response is irrelevant, inappropriate, or not provided.*

Note: If a student makes an error in one part that is carried through to subsequent parts, then the student is not penalized again for the same error.

Algebra 1 ~ Unit 6 Day 3 2 Way Frequency Table Notes

	Athletics	Music/Arts	SGA	Other	Total
Male					*Male total*
Female					*Female total*
Total	*Athletics total*	*Music/arts total*	*SGA total*	*Other total*	*Table total*

Joint Frequency	Marginal Frequencey	Conditional Frequency

Example 1:

	Athletics	Music/Arts	SGA	Other	Total
Male	10	5	1	2	
Female	5	6	0	1	
Total					

What is the joint probability of a male that is involved in SGA?

What is the marginal probability of choosing someone who is involved with athletics?

What is the probability that a randomly chosen male is involved in athletics?

What is the probability that a student who is involve in music/arts is a female?

Algebra 1 ~ Unit 6 Day 3 2 Way Frequency Table HW

1. Using the table below, construct a table displaying the joint and marginal probabilities.

	Dance	Sports	Movies	TOTAL
Women	16	6	8	30
Men	2	10	8	20
TOTAL	18	16	16	**50**

	Dance	Sports	Movies	TOTAL
Women				
Men				
TOTAL				

2. Based on the above tables, which is more likely to occur: a woman who enjoys sports or a male who enjoys movies?

3. Given that a person likes dancing, what is the probability that the person is a male?

4. If we only look at the men, what is the probability that they enjoy sports?

~~~~~~

The following table comes from a survey of 100 hikers on the areas of hiking preferred. Complete the table.

Hiking Area Preference

Gender	The Coastline	Near Lakes & Streams	On Mountain Peaks	Total
Female	18	16		45
Male			14	55
Total		41		

5. What percent of people surveyed prefer to hike on mountain peaks?

6. What percent of females surveyed prefer to hike the coastline?

7. What is the probability that a male prefers to hike near lakes and streams?

8. What is the marginal probability of people who prefer to hike the coastline?

9. What percent of people who prefer to hike the coastline are female?
~~~~~~