TEST NAME: **Statistics**
TEST ID: **2682200**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student:

Class:

Date:

1. The table below shows the number of hours 6 different students studied and the students' grades on a midterm exam.

Hours Studied (x)	0.5	2	4	1.5	3	5
Midterm Grade (y)	64	79	92	82	85	95

This data can be best represented by a linear model. What does the y-intercept of this equation represent?

A. The grade of a student who did not study.

B. The grade of a student who studied for one hour.

C. The rate at which a student's grade improved for every half hour studied.

D. The rate at which a student's grade improved for every hour studied.

2. A dealership began selling a new model of car. The table displays the total number of new model cars, y, the dealership has sold x days after it began selling them.

Time (days)	**Number of Cars Sold**
3	4
9	11
12	18
21	28

What is the meaning of the rate of change when the data is modeled by a best-fit linear model?

A. The dealership sold about 4 cars every 3 days.

B. The dealership sold about 3 cars every 4 days.

C. The dealership sold about 3 cars every day.

D. The dealership sold about 4 cars every day.

3. As a part of a science experiment, Gary makes a small hole in the bottom of a bottle full of water. He records the amount of water left in the bottle at the end of each minute. He repeats this experiment several times and uses the data to develop the linear model $w = -50m + 1200$, which describes the amount of water remaining in the water bottle, in w milliliters, after m minutes. Which statement is a correct interpretation of this linear model?

   A. The water bottle holds 1,200 milliliters of water and loses 50 milliliters per minute.

   B. The water bottle starts with 1,200 milliliters of water and ends with 24 milliliters of water.

   C. The water bottle holds 1,200 milliliters of water and loses 1 milliliter of water every 50 minutes.

   D. The water bottle starts with 1,200 milliliters of water and loses exactly 50 milliliters of water.

4. The equation, $C = 0.15(x - 200) + 9.95$, represents a cell phone company's monthly charge, C, for a text messaging service, where x represents the number of text messages per month. What is the ***best*** interpretation of the slope?

   A. The company charges $9.95 for each text message over 200 per month.

   B. The company charges $0.15 for each text message over 200 per month.

   C. The initial fee for text messaging is $9.95.

   D. The cost for each text is $0.15.

5. The table below shows the number of calories burned per hour by a person running at different speeds.

Speed (mph)	2	3	4	5	6
Calories Burned	213	345	460	510	675

Using a line of best fit, what does the slope represent?

A. the average number of calories burned per hour as the speed increases by 1 mph

B. the average number of calories burned per hour as the speed decreases by 1 mph

C. the average number of calories burned per hour as the speed remains constant

D. the average number of calories burned per hour if no exercise takes place

6. The table below shows the average amount of time Jessica spent on homework each night in grades 8 through 11.

Grade Level	**Time**
8	2 hours 10 minutes
9	2 hours 40 minutes
10	3 hours 5 minutes
11	3 hours 20 minutes

What type of correlation exists between grade level and time spent on homework?

A. strong positive correlation

B. weak positive correlation

C. strong negative correlation

D. weak negative correlation

7. Which correlation coefficient would have the strongest correlation between variables?

A. 0.8

B. 0.3

C. $^{-}0.2$

D. $^{-}0.9$

8. The table below shows the number of floors and heights of 4 buildings in a city.

Number of Floors (x)	**Height** (y)
24	246 feet
27	277 feet
28	282 feet
30	296 feet

What is the ***approximate*** correlation coefficient of the line of best fit for the data?

A. 0.9946

B. 0.9908

C. 0.9856

D. 0.9818

9. For part of a science project, Lany listed the average body temperature in degrees Celsius (°C) of nine different insects at the given air temperatures.

Air Temperature (°C)	Body Temperature (°C)
25.7	27.0
30.4	31.5
28.7	28.9
31.2	31.0
31.5	31.5
26.2	25.6
30.1	28.4
31.5	31.7
18.2	18.7

What does the value of the correlation coefficient for these data describe about the association between air temperature and body temperature of insects?

A. There is a weak positive linear relationship.

B. There is a strong positive linear relationship.

C. There is a weak negative linear relationship.

D. There is a strong negative linear relationship.

10. The table below shows the amount of time Kim spent studying for her 6 math tests last semester and the score she received on each test.

Time (minutes) x	**Score** y
15	89
20	84
35	95
22	98
19	76
0	91

What is the ***approximate*** correlation coefficient when the data is represented by its linear best-fit model?

A. 0.16

B. 0.18

C. 0.82

D. 0.84

11. **Which statement about the relationship between correlation and causation is true?**

A. Causation implies correlation.

B. Correlation implies causation.

C. Positive correlation implies causation.

D. Negative correlation implies a lack of causation.

12. **Kara compared the number of text messages 100 students sent in one day and the grade point average (GPA) of each student. The correlation coefficient among the data is –0.9 rounded to the nearest tenth. Based on this information, which statement is MOST likely true?**

A. There is correlation but not causation between GPA and the number of text messages.

B. There is causation but not correlation between GPA and the number of text messages.

C. There is both correlation and causation between GPA and the number of text messages.

D. There is neither correlation nor causation between GPA and the number of text messages.

13. Which statement **best** describes the relation between correlation and causation?

A. Correlation results in causation.

B. Correlation does not imply causation.

C. Correlation and causation are unrelated.

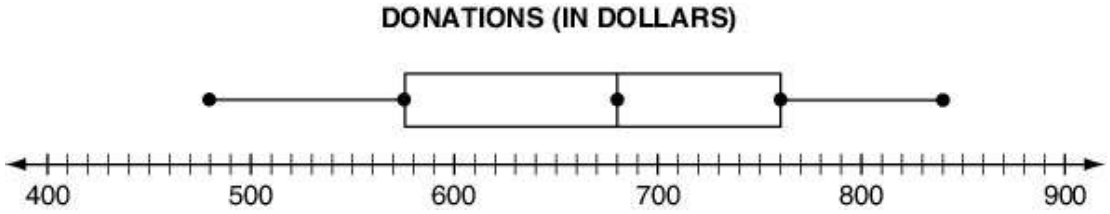
D. Correlation and causation are the same thing.

14. The data below show the donations, in dollars, a charity received from 8 of its donors at a fund-raising event.

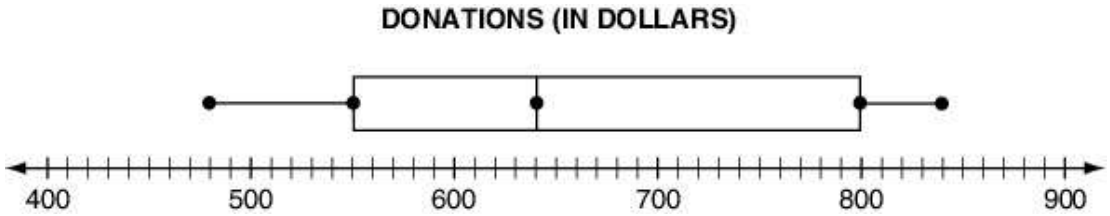
640, 550, 480, 600, 720, 720, 800, 840

Which box plot **correctly** represents these data?

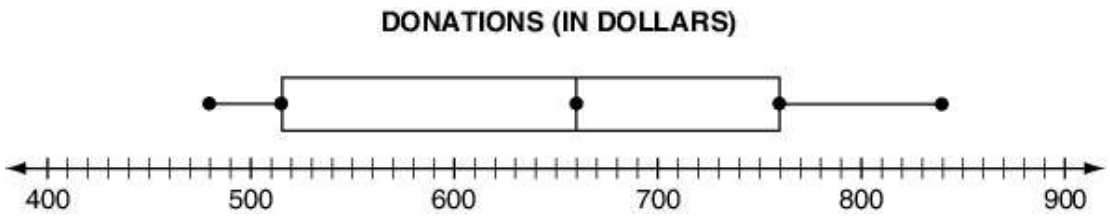
A.



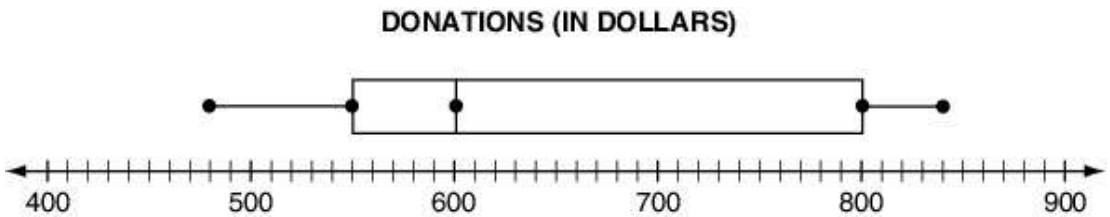
B.



C.



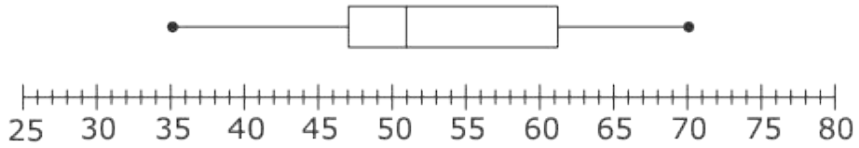
D.



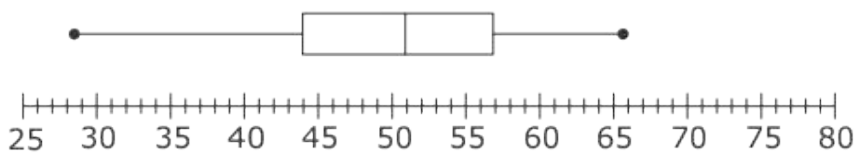
15. Which box plot represents the data set shown below?

{35, 47, 52, 66, 57, 28, 44, 50, 51, 51, 70, 61}

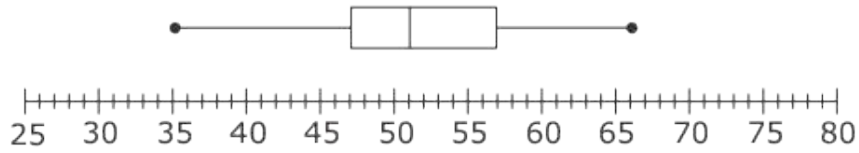
A.



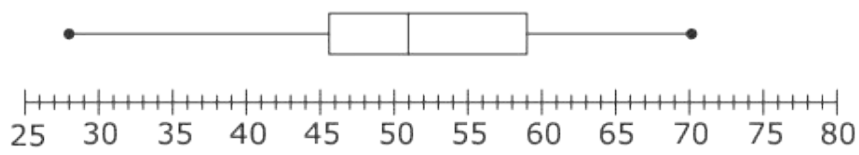
B.



C.



D.

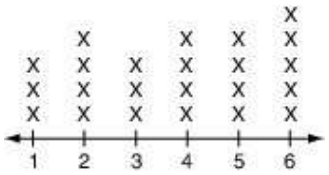


16. Janelia rolled a fair number cube numbered 1 through 6 a total of 23 times. The list shows her outcomes.

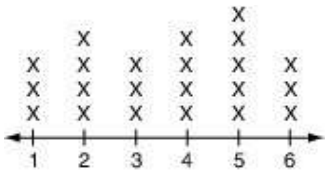
5, 6, 1, 1, 2, 4, 4, 5, 6, 3, 5, 4, 1, 2, 2, 3, 5, 2, 4, 6, 3, 5, 6

Which line plot represents Janelia's outcomes?

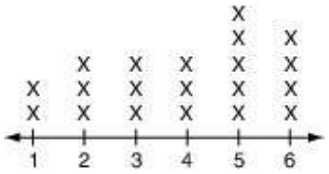
A.



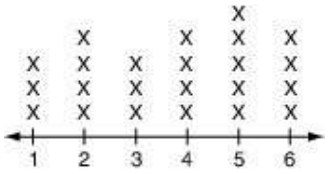
B.



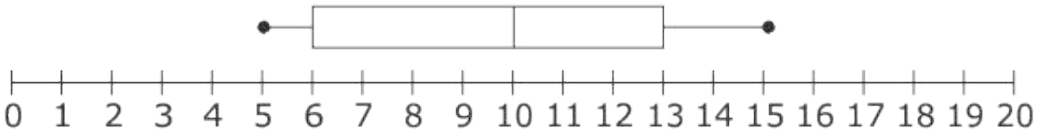
C.



D.



17. Which set of data is displayed in the box plot shown below?



A. 5, 15, 6, 12, 12, 6, 10, 8

B. 11, 14, 5, 7, 5, 9, 12, 15

C. 15, 10, 6, 8, 5, 8, 10, 12

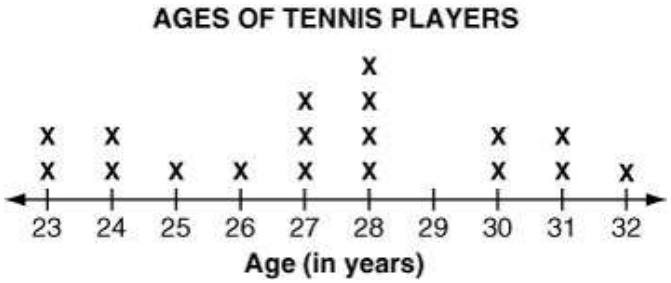
D. 5, 8, 8, 5, 15, 12, 14, 12

18. Andy made a list of the ages of the players selected for a tennis tournament. The ages of the players are listed below.

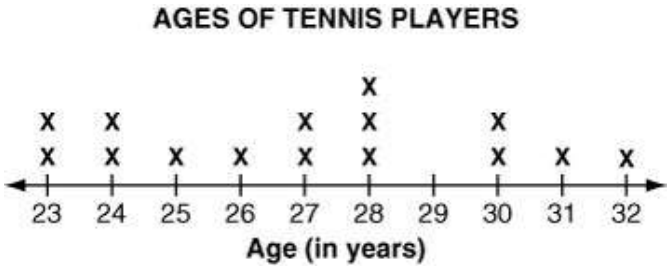
25, 26, 28, 28, 31, 31, 30, 23, 24, 27, 27, 24, 28, 30, 23, 32, 27, 28

Which of these line plots is a correct representation of these data?

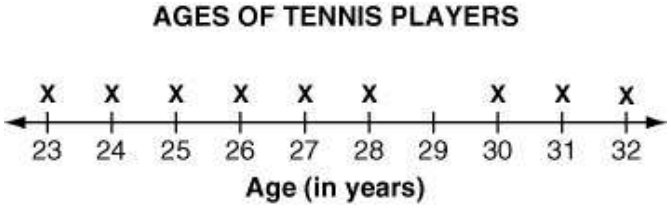
A.



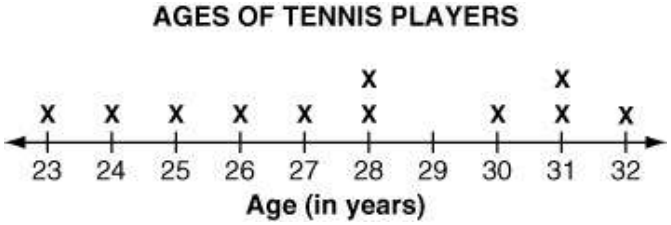
B.



C.



D.



19. Two schools each sent a four-member team to compete in a one-lap swim competition. The table below lists the number of minutes each swimmer took to swim one lap.

Team A

Swimmer	**Time** (in minutes)
1	2.11
2	1.89
3	1.90
4	2.06

Team B

Swimmer	**Time** (in minutes)
1	1.88
2	1.96
3	2.23
4	1.78

What was the faster team's mean, one-lap swimming time and which team does that time belong to?

A. 1.99 minutes; Team A

B. 1.99 minutes; Team B

C. 1.96 minutes; Team A

D. 1.96 minutes; Team B

20. Danny and Dennis are siblings who both own car dealerships. They tracked the number of customers who visited their respective dealerships over seven days and recorded the data in the chart below.

Owner	**Sun.**	**Mon.**	**Tues.**	**Wed.**	**Thurs.**	**Fri.**	**Sat.**
Danny	15	28	8	29	9	20	17
Dennis	19	2	26	27	17	23	29

What is the difference between the interquartile range for the two sets of data?

A. 8

B. 9

C. 10

D. 19

21. The table below shows amounts customers spent at Michael's Shoe Store over a two-day period. The mean for both days was the same.

Michael's Shoe Store Sales

Day 1	Day 2
$96	$110
$80	$98
$100	$110
$110	$100
$90	$85
$140	$140
$92	$98
$145	$80
$70	$75
$120	?

What is the missing value for day two?

A. $98

B. $120

C. $147

D. $157

22. **The stem-and-leaf plot shows the number of stories in the 10 tallest high-rise buildings for City 1 and City 2.**

Ten Tallest High-Rise Buildings

City 1	Stem	City 2
9 9 8 6 5	2	5 6
2 1	3	0 0 0 2
4 1 2	4	0 0 0 0

KEY: |3|0 represents 30
2|4| represents 42

Which statement is supported by the data?

A. City 1 has the building with the least stories.

B. City 2 has the building with the most stories.

C. There are fewer buildings with at least 40 stories in City 1.

D. There are more buildings with less than 30 stories in City 2.

23. Two teachers recorded test scores for a small group of students.

Teacher A	69	73	79	83	93	97	98	100
Teacher B	65	70	73	75	90	93	94	95

What is the ***approximate*** difference in the standard deviation of the two teachers' test scores?

A. 0.06

B. 0.14

C. 0.22

D. 0.48

24. The high temperatures, in degrees Fahrenheit, of several cities were recorded below over a 4-day period.

Monday	Tuesday	Wednesday	Thursday
72, 73, 79, 57, 63, 61, 87	70, 67, 79, 55 67, 65, 89	67, 71, 84, 55, 68, 67, 87	65, 73, 81, 54, 69, 65, 85

Which day had the greatest mean temperature?

A. Monday

B. Tuesday

C. Wednesday

D. Thursday

25. The total daily sales of two different stores are given in the table below.

	Store 1	Store 2
Monday	$1,204	$1,183
Tuesday	$1,487	$1,371
Wednesday	$1,142	$1,684
Thursday	$1,581	$1,851
Friday	$1,724	$1,322
Saturday	$1,182	$1,681

Based on this data, which statement is true?

A. The standard deviation of Store 1 is greater than the standard deviation for Store 2 by about 16.

B. The standard deviation of Store 1 is greater than the standard deviation for Store 2 by about 4.

C. The standard deviation of Store 2 is greater than the standard deviation for Store 1 by about 16.

D. The standard deviation of Store 2 is greater than the standard deviation for Store 1 by about 4.

26. The current age for each member of the Garza family is shown below:

Jim is 49 years old.

Gianneta is 42 years old.

Elizabeth is 22 years old.

Danielle is 18 years old.

Kurt is 15 years old.

Tyler is 9 years old.

Franco is 5 years old.

Pilar is 1 year old.

Which of the following statements accurately compares the ages of the Garza family now, to their ages two years ago? (Two years ago, Pilar was not yet part of the Garza family.)

A. The median age is lower now than it was two years ago.

B. The interquartile range now is less than it was 2 years ago.

C. The interquartile range now is greater than it was two years ago.

D. The median age now is the same as the median age two years ago.

27. **A beauty shop owner collected data on various services provided to clients. The table below shows the number of haircuts and highlights that each hairstylist provided to clients last month.**

Beauty Shop Services

Hairstylist	Haircuts	Highlights
Anna	20	20
Cara	72	25
Darren	35	36
Joyce	42	21
Kiana	64	46
Layla	42	48
Millie	71	37
Niki	66	50
Ray	64	51
Reza	64	52
Steve	44	47
Tonya	46	46

The owner concluded that the median number of haircuts and the median number of highlights provided by the hairstylists was 46. What error did the owner make?

A. She confused the range and the median for each set of data.

B. She deleted repeating numbers when ordering the numbers.

C. She confused the mode for the median in the haircut data set.

D. She chose the number in the middle of the table as the median.

28. The table below displays the birth weights, in pounds, of a random sample of babies born in two different hospitals in 2012.

Birth Weight of Babies (pounds)

Hospital J	Hospital K
6.9	9.9
9.1	8.3
8.6	6.6
5.9	8.1
10.4	7.9
8.6	5.5
7.7	8.8
7.9	9.5
6.5	11
10.5	8.8

Which measure has the greatest difference in baby weights between the hospitals?

A. mean

B. median

C. mode

D. interquartile range

29. The data below shows the number of hours boys and girls spent studying for a test.

Boys: {2, 1, 3, 1, 2, 2}
Girls: {4, 1, 3, 2, 2, 4}

What is the difference in the interquartile range between the girls and boys?

A. 1

B. 2

C. 3

D. 5

30. **Tracey and Mark recorded the number of customers waiting in the first 5 checkout lines at two different grocery stores at the same time of day on the same day of the week. Tracey found {2, 2, 3, 3, and 4} waiting customers in store A. In store B, Mark found {3, 4, 4, 4, and 5} waiting customers. Which one of the following statements is true?**

A. Store A has a spread of 2.8.
B. Stores A and B have an equal spread.
C. Store B has a greater spread than store A.
D. Store B has a spread of 4.

31. Given the data set below:

15, 56, 58, 60, 63, 75, 80, 80, 85

How does the outlier affect the distribution of the data?

A. The outlier skews the distribution to the left.
B. The outlier skews the distribution to the right.
C. The outlier makes the distribution more symmetrical.
D. The outlier has no effect on the distribution.

32. **The number of runs scored by the Lions for six games is shown below.**

5, 9, 1, 5, 2, 7

If the Lions scored 13 runs in their seventh game, which statement is true?

A. The median and the mean both remain the same.
B. The mean and the median both increase.
C. The median increases and the mean remains the same.
D. The mean increases and the median remains the same.

33. An outlier with the value of 14 is added to the data set 3, 4, 5, 6, and 7. How does the outlier affect the mean and median?

A. The mean increases by 0.5, and the median increases by 1.5.
B. The mean increases by 1.5, and the median increases by 0.5.
C. The mean increases by 1.5, and the median increases by 2.0.
D. The mean increases by 2.0, and the median increases by 1.5.

34. Thomas spent two weeks at a lakeside cabin and went fishing every day. The table below shows the number of fish he caught each day of the two-week period.

	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Week 1	0	4	9	2	6	3	4
Week 2	10	7	5	8	3	6	3

If he had caught x fewer fish on one of the days of Week 1, both sets of data would have the same range. What is the value of x?

A. 1

B. 2

C. 7

D. 9

35. The number of points a basketball team scored in 8 games are shown below.

82, 89, 88, 83, 88, 52, 89, 91

Which statement is true?

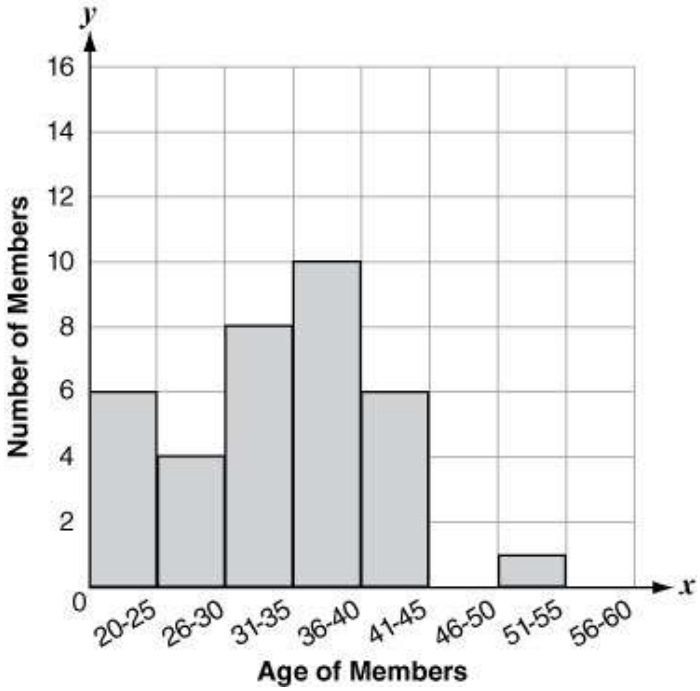
A. When the team scored 52 points, it caused the mean number of points scored to decrease.

B. When the team scored 52 points, it caused the median number of points scored to increase.

C. When the team scored 91 points, it caused the mean number of points scored to decrease.

D. When the team scored 91 points, it caused the median number of points scored to increase.

36. The histogram below shows the ages of the members of a community gym.



How will the mean age of members at the community gym change if the outlier in the data shown is removed?

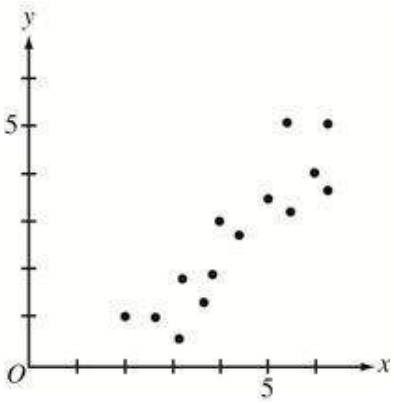
A. The mean age of members will increase.

B. The mean age of members will decrease.

C. The outlier does not affect the mean, so the mean age of members will not change.

D. There is no outlier in this data set, so the change in the mean age of members cannot be determined.

37. **Which of the following equations BEST models the data in the scatterplot below?**



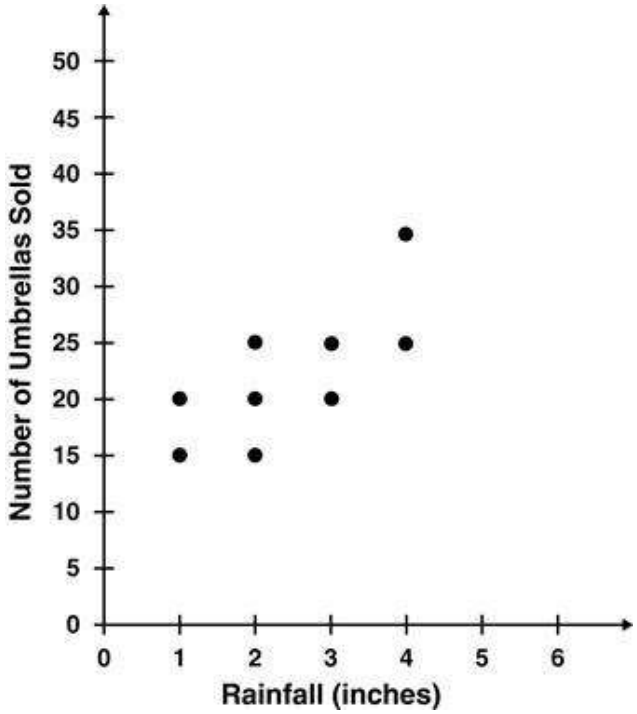
A. $y = x + 2$

B. $y = x - 2$

C. $y = -x + 2$

D. $y = -x - 2$

38. **The following graph shows the number of umbrellas sold at a store relative to the amount of rainfall in the town where the store is located.**



Based on the line of best fit, approximately how many umbrellas would be sold if there were 6 inches of rain in the town?

A. 20
B. 40
C. 60
D. 80

39. The table below shows the arm spans and heights of 8 students in a class.

Arm Span (x)	**Height** (y)
63 inches	65 inches
71 inches	70 inches
62 inches	60 inches
66 inches	64 inches
65 inches	68 inches
72 inches	73 inches
58 inches	60 inches
62 inches	64 inches

Using a linear model for the data, what is the ***approximate*** predicted arm span of a student who is 6 feet tall?

A. 72.3 inches

B. 71.5 inches

C. 61.2 inches

D. 58.6 inches

40. **Janine tested microwave ovens with different power levels to determine how long it would take each oven to bring two cups of room-temperature water to a boil. She recorded the time for each of four ovens in the table below.**

Time to Boil Water

Microwave Power (watts)	**Time (seconds)**
700	85
850	78
1000	70
1100	65

Based on the relationship shown in the table, which is the BEST prediction of the amount of time it would take to boil two cups of room-temperature water in a 1350-watt microwave oven?

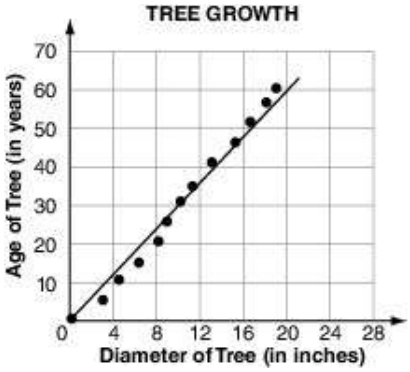
A. 49 seconds

B. 53 seconds

C. 58 seconds

D. 61 seconds

41. The scatter plot below relates the diameter of a particular species of tree, in inches, to its age, in years. The growth rate of a tree, in years per inch, is also known as the growth factor of the tree. The slope of the line of best fit in the scatter plot represents the growth rate, or factor, of the tree.



The table below lists the growth factors of different species of trees.

Tree Species	Growth Factor
Cottonwood	2.0
Silver maple	3.0
Red oak	4.0
White pine	5.0

What species of tree is most likely represented by the scatter plot?

A. Cottonwood

B. Silver maple

C. Red oak

D. White pine

42. Which equation ***best*** models the data in the table below?

x	*y*
−1	3
2	5
4	7
7	9
11	12

A. $y = 0.76x + 3.72$

B. $y = 1.32x - 4.90$

C. $y = 3.72x + 0.76$

D. $y = 4.90x + 1.32$

43. **John is growing a sample of bacteria. He has collected the following data.**

Bacterial Growth

Time (hours)	Number of Bacteria
0	5
1	15
2	45

John needs to divide the sample in half once the number of bacteria has reached 1000. How many hours after the initial time must he divide the sample?

A. 2.41 hours

B. 4.82 hours

C. 33.8 hours

D. 99.5 hours

44. The table below shows the value of a car over 2 years.

Year	0	0.5	1.0	1.5	2.0
Value (dollars)	15,500.00	14,560.00	13,911.20	12,969.66	12,204.09

Using an exponential best-fit model, after ***approximately*** how many years will the car be worth 40% of its original value?

A. 7.2 years

B. 7.7 years

C. 8.2 years

D. 8.7 years

45. Lisa collected data on the grams of fat and the grams of carbohydrates in 10 sandwiches at a popular restaurant. The table below represents the data she recorded.

Fat (in grams, x)	Carbohydrates (in grams, y)
42	49
65	53
48	50
23	29
12	32
18	32
37	40
30	38
24	36
17	31

Which linear equation best fits Lisa's data?

A. $y = 0.5x + 23$

B. $y = 23x + 0.5$

C. $y = 1.5x + 27$

D. $y = 27x + 1.5$