TEST NAME: **NAMSIM11314S-ID.6**
TEST ID: **130080**
GRADE: **09**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student:

Class:

Date:

1. The table below shows the population of a state over 40 years.

Year	Population
1960	4,556,155
1970	5,084,411
1980	5,880,095
1990	6,628,637
2000	8,049,313

Using an exponential model, in what year will the population initially exceed 10 million?

A. 2010

B. 2018

C. 2020

D. 2028

2. 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?

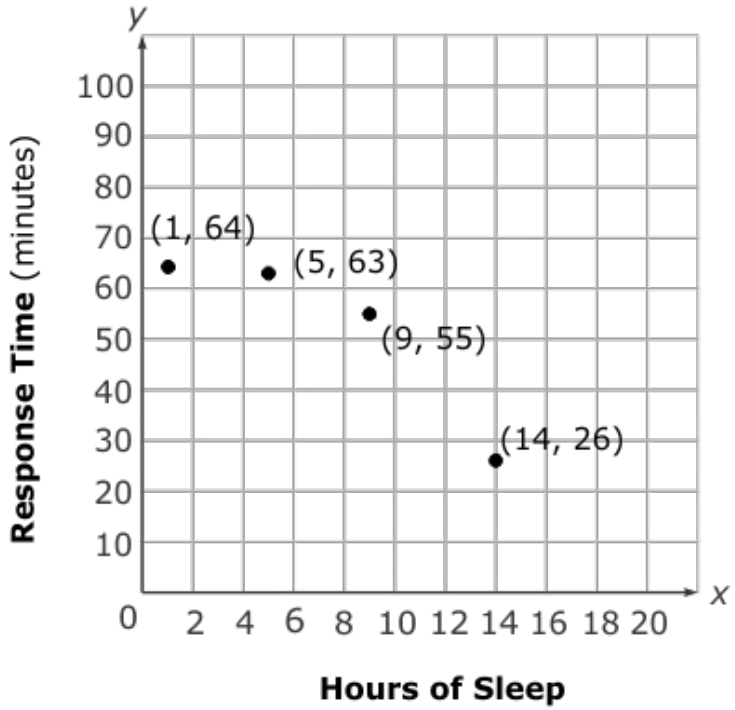
A. 72.3 inches

B. 71.5 inches

C. 61.2 inches

D. 58.6 inches

3. The scatterplot below shows the number of hours of sleep that 4 teenagers got before taking the SAT and the average response time in seconds it took for those teens to answer each question.



Using the equation of the line of best fit, how many hours of sleep would you expect a teen to get to have a response time of 46 seconds?

A. 7.25 hours

B. 9.31 hours

C. 13 hours

D. 60.76 hours

4. The table below shows the boiling point of water, y, at different barometric pressures, x.

Barometric Pressure	**Boiling Point** (°F)
200	140.18
300	152.38
400	164.44
500	178.16
600	186.98
700	194.18
800	200.30
900	206.96
1,000	213.53

Using the line of best fit for the data, what is the ***approximate*** temperature predicted for a barometric pressure of 250?

A. 127.41°F

B. 145.78°F

C. 146.28°F

D. 149.91°F

5. The table below shows per capita consumption of bottled water for selected years, 1980–2005.

Year	Gallons Per Capita
1980	2.7
1985	5.1
1990	8.8
1995	11.6
2000	16.7
2005	25.4

Based on a line of best fit of the data, ***about*** how fast is the consumption of bottled water growing each year?

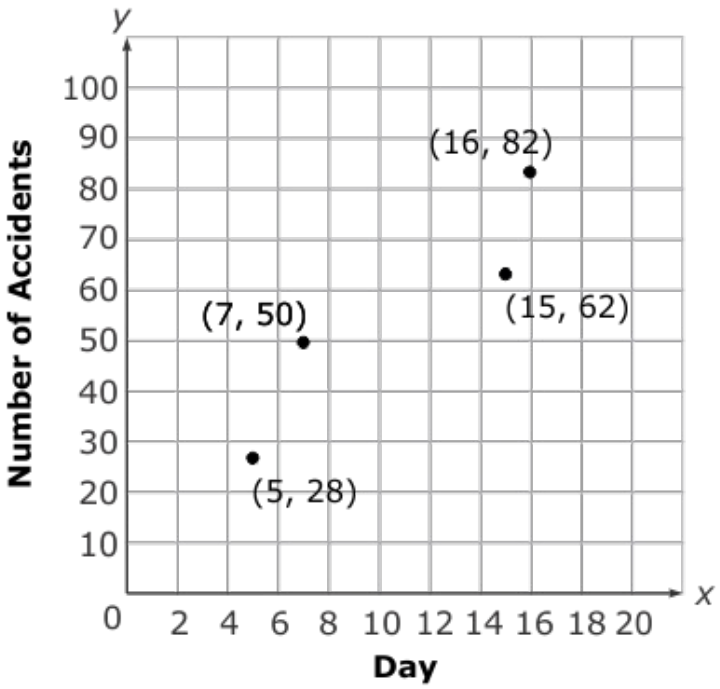
A. 0.59 gallon per capita per year

B. 0.86 gallon per capita per year

C. 0.91 gallon per capita per year

D. 1.09 gallons per capita per year

6. The scatterplot below shows the number of days the temperature was below 20° in 4 different cities and the number of weather-related car accidents in those cities during the month of January.



Which equation ***best*** fits the data?

A. $y = 2.13x + 14.7$

B. $y = 2.73x + 12.55$

C. $y = 3.73x + 15.4$

D. $y = 4.38x + 10.4$

7. The table below shows the average verbal and math score on a test for students in seven states.

State	**Verbal Score** (x)	**Math Score** (y)
State 1	418	466
State 2	401	443
State 3	430	478
State 4	401	440
State 5	397	437
State 6	425	470
State 7	443	490

Using the line of best fit for the data, what is the ***approximate***predicted average math score for a state that had an average verbal score of 500?

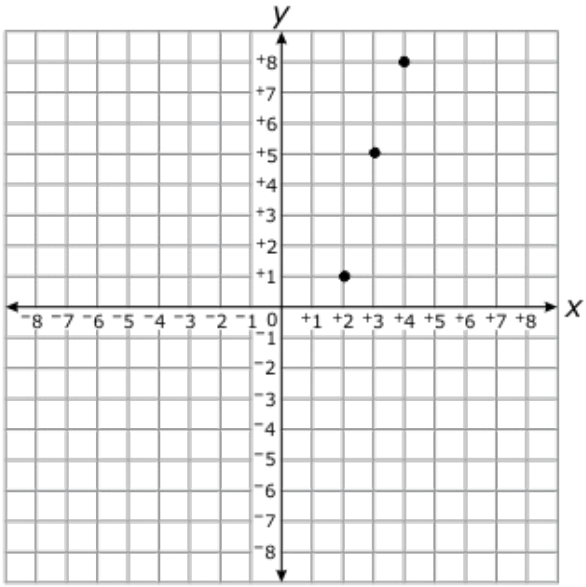
A. 550

B. 560

C. 570

D. 580

8. Using the graph, which is the ***approximate*** line of best fit for these data?



A. $y = 3x - 4$

B. $y = 3.5x - 5.8$

C. $y = 4x - 7$

D. $y = 4.5x - 10.2$

9. The table below shows the population (in millions) of several states and the number of electoral votes those states have.

Population	Electoral Votes
8.4	15
4.1	8
17.0	27
8.7	15

Using the line of best fit for the data, ***about*** how many electoral votes should a state with a population of 7.4 million have?

A. 11

B. 12

C. 13

D. 14

10. The table below shows the shoe size and height of 8 players on a basketball team.

Shoe Size	**Height** (inches)
8.5	65.5
10.0	68.5
12.0	72.7
9.5	67.6
10.5	69.7
9.0	66.3
11.0	70.6
13.0	74.9

Using the line of best fit for the data, ***about*** how much does height increase for each 1.0 increase in shoe size?

A. 0.5 inch

B. 1 inch

C. 2 inches

D. 3 inches

11. 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

12. A set of data is shown in the table below.

x	***y***
1	12.6
2	15.4
3	18.5
5	24.2
6	27.4

Assuming a linear relationship, what is the predicted value of y when $x = 4$?

A. 19.4

B. 20.4

C. 21.4

D. 22.4

13. The table shows the growth of a certain type of bacteria.

Time in Days (x)	0	2	4	6	8
Number of Cells (N)	120	270	631	1,450	3,360

Which equation ***best*** models this set of data?

A. $N = 1.52(118.8)^x$

B. $N = 118.8(1.52)^x$

C. $N = 75x + 120$

D. $N = 383x - 365.8$

14. The table below shows the number of chickens on a farm in different years.

Years Since 2002 (x)	**Number of Chickens** (y)
0	282
1	440
2	596
3	753
4	910
5	1,068

Assuming a linear relationship, which is the ***best***prediction of the number of chickens on the farm in 2015?

A. 1,728

B. 2,001

C. 2,324

D. 2,638

15. The table below shows the value of a car over two years.

Year	**Value**
0	$15,500.00
0.5	$14,560.00
1	$13,911.20
1.5	$12,969.66
2	$12,204.09

Which equation ***best*** models the value of the car, y, after x years?

A. $y = {}^{-}1{,}636.4x + 15{,}465.4$

B. $y = {}^{-}1{,}647.9x + 12{,}204.09$

C. $y = 15{,}465.4x - 1{,}636.4$

D. $y = 12{,}204.09x - 1{,}647.9$

16. The electric company is installing new electric meters in a neighborhood. The table below shows the number of homes in the neighborhood with meters installed after different numbers of weeks.

Week	Meters Installed
0	8
1	15
2	29
3	54
4	102

Using an exponential best fit model, ***approximately*** how many homes will have meters installed after 6 weeks?

A. 194

B. 266

C. 366

D. 443

17. A trucking company collected data on the distance and time required for several deliveries.

Distance (miles)	**Time** (hours)
85	1.6
120	3.0
153	3.2
185	4.0
210	4.2
250	5.0

Using a linear best fit model, ***approximately*** how many hours would be needed for a delivery of 225 miles?

A. 4.3

B. 4.5

C. 4.7

D. 4.9

18. A data set is shown below.

x	*y*
1	6.00
2	5.04
3	4.23
4	3.56
5	2.99
6	2.51
7	2.11

Using an exponential best-fit model, what is the predicted value of y when $x = 10$?

A. 1.78

B. 1.49

C. 1.25

D. 0.88

19. 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. $y = 4.90x + 1.32$

20. The table below shows ticket prices for the years 2000 to 2006.

Year (x)	**Ticket Price** (y)
2000	$3.00
2001	$3.00
2002	$4.00
2003	$5.00
2004	$5.50
2005	$6.00
2006	$6.00

Using the line of best fit for the data, which choice is the ***best*** prediction of the price of a ticket in 2010?

A. $7.50

B. $7.70

C. $8.25

D. $8.80

21. Using the exponential best fit model for the data below, what is the value of y when $x = 1$?

x	***y***
2	2.25
4	20.25
6	182.25

A. 0.25

B. 0.50

C. 0.75

D. 1.25

22. The table below shows the height of a plant, in inches, over 5 weeks.

Week (x)	**Height** (y)
0	0
1	1
2	3
3	6
4	8
5	11

Which is an ***approximate*** equation of the line of best fit for the data?

A. $y = 2x - 0.5$

B. $y = 2.2x$

C. $y = 2.25x - 0.8$

D. $y = 2.5x - 0.4$

23. The table below shows the average attendance at a football team's games in different years.

Year	**Attendance**
2000	7,650
2002	9,999
2004	11,190
2006	13,008

Assuming a linear trend, in what year was the team's attendance first predicted to be greater than 20,000?

A. 2008

B. 2010

C. 2012

D. 2014

24. The table shows the number of customers, R, that entered a store over several weeks, w.

Week	0	1	2	3	4
Customers (in thousands)	8	15	29	54	102

Which equation ***best*** fits these data?

A. $R = 1.89w + 8$

B. $R = 8w + 1.89$

C. $R = 8(1.89)^w$

D. $R = 1.89(8)^w$

25. The table below shows the amount of rainfall in an area over 4 weeks.

Week (x)	**Rainfall** (y)
1	6 inches
2	8 inches
3	9 inches
4	11 inches

Which equation ***best*** fits the data?

A. $y = 1.6x + 4.5$

B. $y = 4.5x + 1.6$

C. $y = 5.1(1.2)^x$

D. $y = 1.2(5.1)^x$

26. Which equation is the exponential best-fit model for the data in the table below?

x	1	2	3	4	5	6	7
y	6.00	5.04	4.23	3.56	2.99	2.51	2.11

A. $y = 0.4(6.3)^x$

B. $y = 0.8(7.1)^x$

C. $y = 6.3(0.4)^x$

D. $y = 7.1(0.8)^x$

27. The starting salaries for the employees at a company from 1996 to 2002 are shown in the table below.

Year	**Salary**
1996	$28,680
1998	$29,255
2000	$29,882
2002	$30,719

Using the line of best fit for the data, in what year is the starting salary predicted to be about $35,000?

A. 2008

B. 2011

C. 2012

D. 2015

28. The table shows the number of hours spent studying and the exam grade earned.

Hours Studied	Exam Grade
0.5	70
1	80
1.5	82
2	85
2.5	88

Using a linear model, ***approximately*** how many hours would a student study to earn a 97?

A. 3 hours

B. 3.5 hours

C. 4 hours

D. 5 hours

29. Haley's science class recorded the amount of a material left each day to see how it changed. Their results are shown in the table below.

Day	Amount Left
1	23.14
2	10.51
3	6.75
4	3.24
5	1.73
6	0.84
7	0.42
8	0.17
9	0.13
10	0.03

Using the equation of best fit for the data, ***about*** how much of the material was predicted to be left after $3\frac{1}{2}$ days?

A. 8.61

B. 6.48

C. 5.00

D. 4.40

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

x	***y***
1.0	11.4
2.5	17.8
4.0	23.7
5.5	29.8

A. $3x - y = {}^{-}9.4$

B. $4x - y = {}^{-}7.4$

C. $5x - y = {}^{-}5.0$

D. $6x - y = {}^{-}5.4$

31. The table below shows the amount of time Darrell studied for six math tests and the grade he earned on each test.

Time (minutes)	**Grade**
20	72
25	74
37	81
40	81
52	85
57	88

Using the line of best fit for the data, what grade is Darrell predicted to earn if he studies for 1 hour?

A. 88

B. 89

C. 90

D. 91

32. The cost for several phone calls made are given in the table.

Number of Minutes	**Cost of Phone Call** ($)
5	0.21
10	0.31
12	0.35
20	0.51
24	0.59
33	0.77

Using a linear model, what is the cost for a 40 minute phone call?

A. $1.24

B. $0.91

C. $0.87

D. $0.11

33. The table below shows the average value of gold per troy ounce in different years.

Years Since 2000	**Value**
0	$279
2	$310
4	$410
6	$603
8	$872
10	$1,225

Using a linear model, what is the ***approximate***difference in the actual and predicted value for 2004?

A. $112

B. $171

C. $239

D. $522

34. Sharon recorded the outside temperature, x, and the temperature inside a car, y, at six different times during a day. The results are shown in the table below.

Outside Temperature (°F)	**Inside Temperature** (°F)
61	62
69	64
81	82
86	90
96	97
100	96

Sharon then modeled the data using the line of best fit. Which statement is true about the line based on the residuals for the data?

A. Since the residuals are scattered above and below the the line, the linear model is a good fit.

B. Since the residuals form a pattern, the linear model is not a good fit.

C. Since the majority of the residuals are above the line, the linear model is a good fit.

D. Since the majority of the residuals are below the line, the linear model is not a good fit.

35. The table below shows the height and weight of the five players in the starting lineup of a basketball team.

Height (inches)	**Weight** (pounds)
60	120
64	135
67	142
70	160
71	167

Based on the line of best fit, what does the residual value for the 71 inch player represent?

A. The predicted weight is approximately 3.1 pounds less than the player's actual weight.

B. The predicted weight is approximately 3.1 pounds more than the player's actual weight.

C. The predicted weight is approximately 2.4 pounds less than the player's actual weight.

D. The predicted weight is approximately 2.4 pounds more than the player's actual weight.

36. The table below shows the height and weight of 6 students in Mrs. Kale's class.

Height (inches)	**Weight** (pounds)
50	75
51	75
52.5	76
52	77
52	78
54	80

Using a linear model, what is the ***approximate***value of the residual of the student 51 inches tall?

A. $^{-}3.3$

B. $^{-}0.7$

C. $+0.7$

D. $+3.3$

37. A set of data is shown below.

x	⁻1	0	1	2	3	4	5
y	3	7	5	6	7	8	8

Using a line of best fit, what is the ***approximate*** value of the residual for the data at $x = 2$?

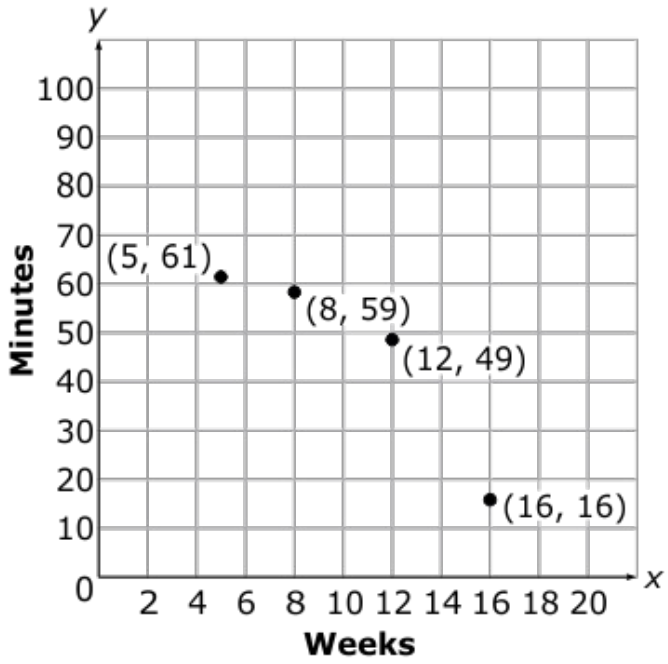
A. ⁻0.815

B. ⁻0.286

C. 0.286

D. 0.815

38. A scatter plot for Deanna's race times and weeks training are displayed below.



In what week was Deanna's time closest to her time predicted by the line of best fit for the data?

A. 5

B. 8

C. 12

D. 16

39. The graph shows the number of visitors attending the panda exhibit at the zoo each day after the birth of a new baby panda. The equation of the line of best fit for the data is $y = 2.61x + 21.21$.

Which ordered pair would ***best*** fit the model given?

A. (6, 44)

B. (10, 53)

C. (12, 60)

D. (16, 65)

40. The table below shows a linear relation.

x	*y*
0	$^{-}5$
1	$^{-}2$
2	1
3	5
4	8
5	12

Using a linear model, how many residuals of the relation will be negative?

A. 1

B. 2

C. 3

D. 4

41. The table below shows the amount a banquet hall charges to feed different sized groups of people.

Number of People	**Cost**
10	$200
14	$252
21	$441
23	$471

Using a linear model, what is the ***approximate***residual value of the cost to feed 21 people?

A. $9

B. $12

C. $15

D. $21