

Name \_\_\_\_\_  
8A: Algebra 1

Date \_\_\_\_\_  
Period \_\_\_\_\_

Regents Review  
Take Home Review Quiz #3

**\*\*Show ALL work on exam where possible to receive full credit\*\***

Due: \_\_\_\_\_

#'s 1-24: Write the number on the line. **2 points each.**

#'s 25-30: Leave all work on exam. **2 points each.**

#'s 31-34: Leave all work on exam. **4 points each.**

#35 Leave work on exam. **6 points**

**\*\*\*Out of 82 points just like the regents\*\*\***

1) \_\_\_\_\_

11) \_\_\_\_\_

21) \_\_\_\_\_

2) \_\_\_\_\_

12) \_\_\_\_\_

22) \_\_\_\_\_

3) \_\_\_\_\_

13) \_\_\_\_\_

23) \_\_\_\_\_

4) \_\_\_\_\_

14) \_\_\_\_\_

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15) \_\_\_\_\_

25-35: Leave on exam

6) \_\_\_\_\_

16) \_\_\_\_\_

7) \_\_\_\_\_

17) \_\_\_\_\_

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18) \_\_\_\_\_

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19) \_\_\_\_\_

10) \_\_\_\_\_

20) \_\_\_\_\_

## Reference Sheet for Algebra I (NGLS)

### Conversions

1 mile = 5280 feet  
 1 mile = 1760 yards  
 1 pound = 16 ounces  
 1 ton = 2000 pounds

### Conversions Across Measurement Systems

1 inch = 2.54 centimeters  
 1 meter = 39.37 inches  
 1 mile = 1.609 kilometers  
 1 kilometer = 0.6214 mile  
 1 pound = 0.454 kilogram  
 1 kilogram = 2.2 pounds

Quadratic Equation	$y = ax^2 + bx + c$
Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Equation of the Axis of Symmetry	$x = -\frac{b}{2a}$
Slope	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Linear Equation Slope Intercept	$y = mx + b$
Linear Equation Point Slope	$y - y_1 = m(x - x_1)$

Exponential Equation	$y = ab^x$
Annual Compound Interest	$A = P(1 + r)^n$
Arithmetic Sequence	$a_n = a_1 + d(n - 1)$
Geometric Sequence	$a_n = a_1 r^{n-1}$
Interquartile Range (IQR)	$IQR = Q_3 - Q_1$
Outlier	Lower Outlier Boundary = $Q_1 - 1.5(IQR)$
	Upper Outlier Boundary = $Q_3 + 1.5(IQR)$



10. A rocket is launched from the ground. The function  $h(t) = -4.9t^2 + 180t$  models the height of a rocket launched from the ground  $t$  seconds after it is launched. If all other factors remain the same, which of the following function models the height of a rocket above the ground after  $t$  seconds if it is launched from a platform 100 feet in the air?

- (1)  $h(t) = -4.9t^2 + 280t$                       (3)  $h(t) = -4.9t^2 + 180t + 100$   
 (2)  $h(t) = -4.9t^2 + 180t - 100$             (4)  $h(t) = -4.9t^2 + 180(t + 100)$       10 \_\_\_\_\_

11. What is the sum of  $-2x^2 - 5x + 3$  and  $-4x^2 \div 4x - 6$ ?

- (1)  $6x^2 - x - 3$                                   (3)  $2x^2 + 9x - 3$   
 (2)  $-6x^2 - x - 3$                               (4)  $-6x^2 + 9x - 3$                           11 \_\_\_\_\_

12. Which situation describes a correlation that is *not* a causal relationship?

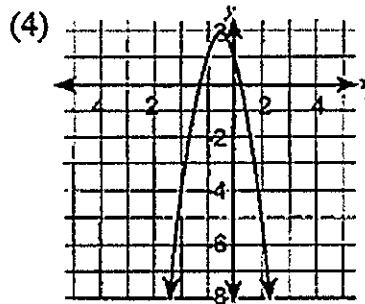
- (1) Car color and number of car accidents  
 (2) Hours spent studying and test score  
 (3) Amount of exercise each week and the time it takes to run a mile  
 (4) Distance to reach a destination and the amount of gasoline used      12 \_\_\_\_\_

13. Which function has the largest maximum?

- (1)  $y = -x^2 + 2x - 1$                               (3)  $y = -2x^2 - 3x + 4$

(2)

$x$	$y$
-3	-2
-2	1
-1	2
0	1
1	-2



13. \_\_\_\_\_

14. The accompanying table shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited. Which type of function best models the given data?

Year	Balance, in Dollars
0	380.00
10	562.49
20	832.63
30	1232.49
40	1824.39
50	2700.54

- (1) linear function with a negative rate of change  
 (2) linear function with a positive rate of change  
 (3) exponential decay function  
 (4) exponential growth function

14. \_\_\_\_\_

15. What is the degree of the polynomial  $2x + x^3 + 5x^2$ ?

- (1) 1                      (2) 2                      (3) 3                      (4) 4                      15 \_\_\_\_\_

16. Maxwell and Jessica went to the candy store. Maxwell bought one chocolate covered cookie and two lollipops for \$2.50. Jessica bought one chocolate covered cookie and four lollipops for \$3.00. How much does one lollipop cost?

- (1) \$0.25                  (2) \$0.40                  (3) \$.50                      (4) \$1.00                  16 \_\_\_\_\_

17. If  $x = \frac{a^2}{b}$ , which situation would always double the value of  $x$ ?

- (1) Doubling the value of  $a$ .                  (3) Doubling the value of  $b$ .  
 (2) Halving the value of  $a$ .                  (4) Halving the value of  $b$ .                  17 \_\_\_\_\_

18. Jessica is planning to build a square playing field. She wants to see how long the sides of the field will need to be for different areas. Her results are summarized in the following table.

Area (square feet)	Side Length (feet)
100	10
200	14.14
300	17.32
400	20
500	22.36
600	24.49
700	26.46
800	28.28
900	30

What is the average rate of change in the side length as the area increases from 200 square feet to 700 square feet?

- (1) .025                  (2) 20                      (3) 40                      (4) 800                      18 \_\_\_\_\_

19. The selling prices for a group of cars were recorded when the cars were new and for an additional five years. The results are summarized in the tables below. Based as a percent, which car's price dropped at a constant rate each year?

- (1) 

Year	Cost
0	25,000
1	20,000
2	15,000
3	10,000
4	5,000
5	0

     
 (2) 

Year	Cost
0	25,000
1	30,000
2	35,000
3	40,000
4	45,000
5	50,000

     
 (3) 

Year	Cost
0	25,000
1	20,000
2	16,000
3	12,800
4	10,240
5	8,192

     
 (4) 

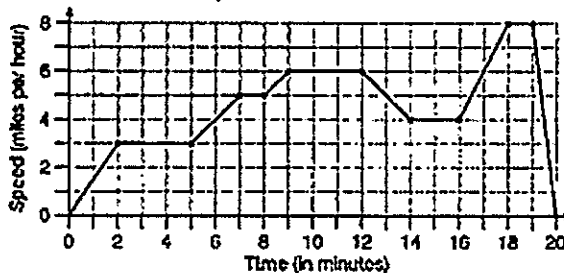
Year	Cost
0	25,000
1	30,000
2	36,000
3	43,000
4	52,840
5	62,208

20. Officials in a town use a function,  $C$ , to analyze traffic patterns.  $C(n)$  represents the rate of traffic through an intersection where  $n$  is the number of observed vehicles in a specified time interval. What would be the most appropriate domain for the function?

- (1)  $\{\dots, -2, -1, 0, 1, 2, 3, \dots\}$       (3)  $\{0, \frac{1}{2}, 1, 1\frac{1}{2}, 2, 2\frac{1}{2}\}$   
 (2)  $\{-2, -1, 0, 1, 2, 3\}$       (4)  $\{0, 1, 2, 3, \dots\}$

20 \_\_\_\_\_

21. The graph represents a jogger's speed during her 20-minute jog around her neighborhood.



Which statement best describes what the jogger was doing during the 9 – 12 minute interval of her jog?

- (1) She was standing still.  
 (2) She was increasing her speed.  
 (3) She was decreasing her speed.  
 (4) She was jogging at a constant rate.

21 \_\_\_\_\_

22. In the expression  $5x^3 - 4x^2 + 2x + 3$ , what is the coefficient of the quadratic term?

- (1) -5      (2) -4      (3) 3      (4) 4

22 \_\_\_\_\_

23. The table below displays data collected from the census. What is the correlation coefficient between years of education past 8<sup>th</sup> grade and average yearly salary in the United States to the *nearest hundredth*?

Years of education past 8 <sup>th</sup> grade	Average Yearly Salary
2 years (10 <sup>th</sup> grade)	23,088
4 years (High School Graduate)	32,552
6 years (Associates' Degree)	39,884
8 years (Bachelor's Degree)	53,976
9 years (Master's Degree)	66,144
11 years (Doctorate)	80,600

- (1) .96      (2) .97      (3) .98      (4) .99

23 \_\_\_\_\_

24. Which function below correctly illustrates the absolute value function?

- (1)  $|a| = \begin{cases} a, & \text{if } a \leq 0 \\ -a, & \text{if } a > 0 \end{cases}$       (3)  $|a| = \begin{cases} \sqrt{a}, & \text{if } a \geq 0 \\ -a, & \text{if } a < 0 \end{cases}$   
 (2)  $|a| = \begin{cases} a, & \text{if } a \geq 0 \\ -a, & \text{if } a < 0 \end{cases}$       (4)  $|a| = \begin{cases} a, & \text{if } a \geq 0 \\ -\sqrt{a}, & \text{if } a < 0 \end{cases}$

24 \_\_\_\_\_

\*\*\*Remember to show as much work as possible to get full credit\*\*\*

25. Solve  $x^2 - 9x = 36$  algebraically for all values of  $x$ .

26.

Ms. Fox asked her class "Is the sum of 4.2 and  $\sqrt{2}$  rational or irrational?" Patrick answered that the sum would be irrational.

State whether Patrick is correct or incorrect. Justify your reasoning.

27. Find the  $y$ -intercept(s), for the equation:  $y = x^2 - 16$

28.

A function is shown in the table below.

$x$	$f(x)$
-4	2
-1	-4
0	-2
3	16

If included in the table, which ordered pair,  $(-4, 1)$  or  $(1, -4)$ , would result in a relation that is no longer a function? Explain your answer.

29. Factor  $18x^2 - 2$  completely.

30.

Given the function  $f(x) = -x^2 + 8x + 9$ , state whether the vertex represents a maximum or minimum point for the function. Explain your answer.

31. A teacher surveyed a small senior class to find out how many hours they worked last week and their wages. The information from each student is summarized in the table.

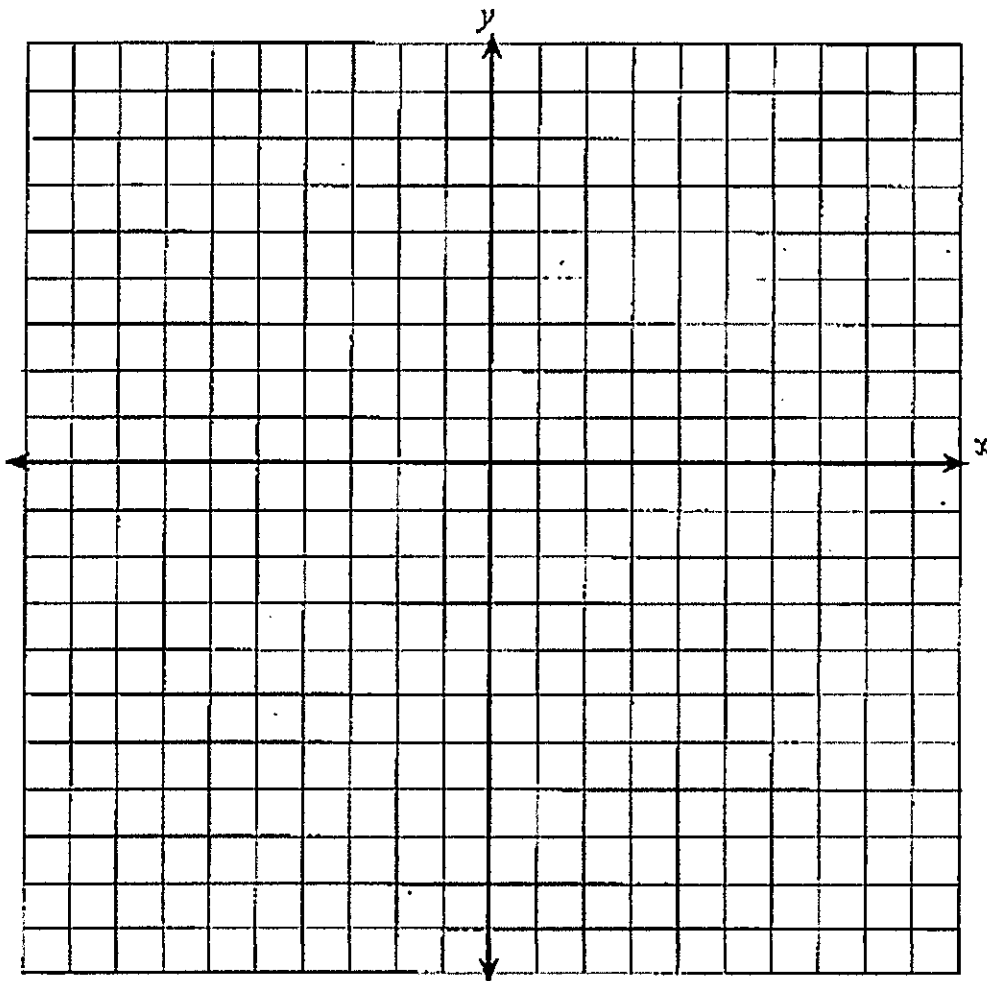
Find the linear regression equation for the data in the table. Round all coefficients to the *nearest hundredth*.

Hours	Wages
20	250
15	180
14	200
32	350
0	0
5	100
40	380
12	100

Using your regression equation, how much money would someone make if he or she worked 25 hours last week? Round to the *nearest cent*.



32. Graph the function:  $y = |x| + 3$ , for domain  $-4 \leq x \leq 3$



33. The following data is the set of quiz scores from Ms. Jones' algebra class:

56, 82, 78, 90, 99, 73, 85, 95, 76, 88, 100

Create a box plot for the data.

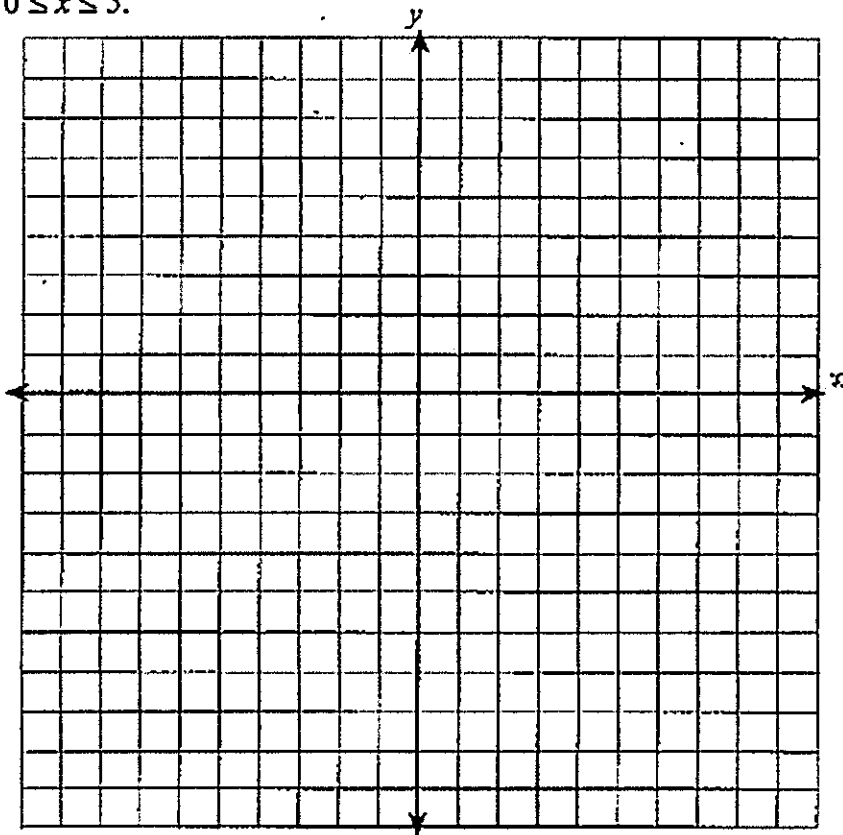
Find the interquartile range for the class.

Is the quiz score 56 considered to be an outlier? Justify your answer by using the outlier formulas.

34. Use: LES to solve the following

A school is building a rectangular soccer field that has an area of 6000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

35. Sketch the graph of all of the solutions to the equation  $y = \frac{1}{4}(2)^x$  where  $0 \leq x \leq 5$ .



Over the  $x$ -intervals(not  $y$ ) find the average rate of change between 2 and 5.

\*\*Make sure to use the average rate of change formula!