

Algebra 1

Name _____

Semester 2 Final Exam REVIEW

1. What is the simplified form of this expression? $\frac{12x^7y^54x^7y^3}{8x^8y^8}$
2. Select all of the expressions that are equivalent to $(2^2 * 3^6)(3^2 * 2^5)$?
 - A. $6^7 * 6^{11}$
 - B. $2^7 * 3^8$
 - C. $2^6 * 3^{12}$
 - D. 839,808
3. What is the sum? $\sqrt{54} + \sqrt{24}$
4. What is the rationalized and simplified form of this expression? $\frac{\sqrt{6}}{\sqrt{12}}$
5. In a geometric sequence, $a_4 = 20$, $a_5 = -100$, and $a_6 = 500$. What is the **recursive** formula for this sequence?
6. The standard rate of car depreciation is 15% per year. Daniel buys a car originally worth \$40,000. To the nearest dollar, how much will the car be worth in 6 years?

7. Which of the following tables show exponential growth?

x	y
0	2
1	8
2	32
3	128

Table 1

x	y
0	10
1	14
2	18
3	22

Table 2

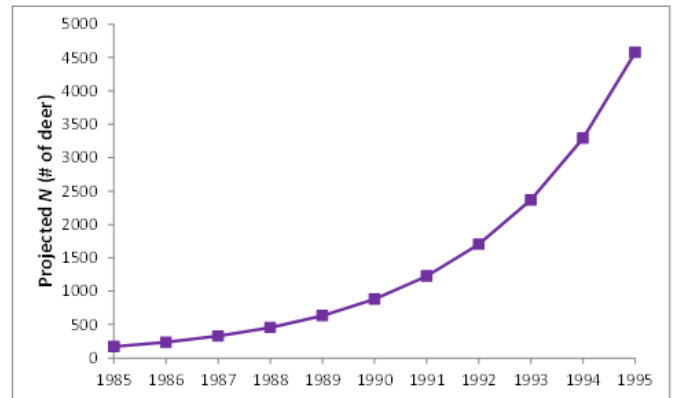
x	y
0	5
1	9
2	14
3	20

Table 3

x	y
0	3
1	6
2	12
3	24

Table 4

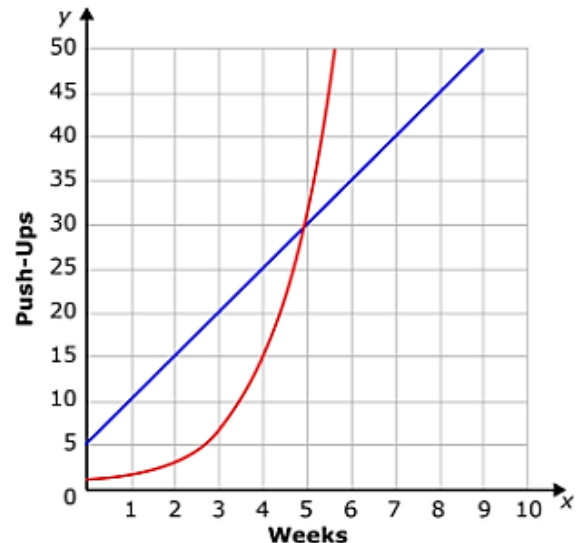
8. This exponential function for deer population is modeled with the function $f(x) = 170(1.39)^x$, which is graphed below. During what two years does the deer population grow the most? The least?



9. Consider the function given by the equation $y = -7(1.5)^x$. What is the domain of the function? What is the range?

10. A girl's gym class and boy's gym class begin doing push-ups in class. The boys start with 5 push-ups and add 5 more per week. The girls begin by doing one push up at the beginning of the week and they double that number every week.

In which week will the girls begin to do more push-ups than the boys?



11. What is the difference of the polynomials?

$$(5x^3 - 3x^2 + 7x - 11) - (4x^2 - 8)$$

12. Multiply. $(2a + 4)(a + 7)$?

13. What is the greatest common factor of the expression $24x^3y + 16xy^3 + 4xy$?

14. Factor. $x^2 + 18x - 40$?

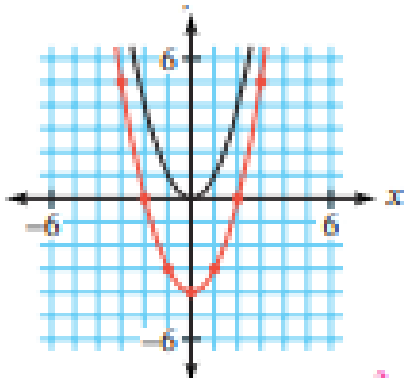
15. Factor completely. $3x^2 + 9x - 30$?

16. What is the fully simplified form of the expression $\frac{16x^5 - 8x^3 + 4x^2}{4x^2}$?

17. What is the result when $a^2 + 9a + 14$ is divided by $a + 7$?

18. What is the simplified product of $\frac{2y}{3x} * \frac{9x}{2z} * \frac{6yz}{x}$?

19. The graph of the parent function $f(x) = x^2$ is shown with the graph of $g(x)$ which is a translation of the parent function. Write the equation $g(x)$ which represents the transformation from the graph of the parent function.



20. State the range for the quadratic function, $g(x) = x^2 - 6$.

21. Solve the equation $x^2 - 4x = 12$.

22. Solve the equation $x^2 + 8x - 6 = 0$.

23. What are the solutions to the equation, $0 = x^2 - 6x + 3$, round to the nearest hundredth.

24. Simplify $\sqrt{-48}$

25. Solve the equation $x^2 + 81 = 0$.

26. The total time that the *Spirit* parachute was in the air after the engine burned out is modeled by using the function, $h(t) = -16t^2 + 64t + 512$, where height (h) in feet and time (t) is seconds. Find the time that the *Spirit* took to strike the Earth after the engine burned out.

27. The rate at which bacterium grows, doubles every 20 to 30 minutes, according the FDA. What function should be used to model the bacterium growth rate over time.

28. Which function has a value of $y = 23$ when $x = 0$ and triples each time the value of x increases by 1?

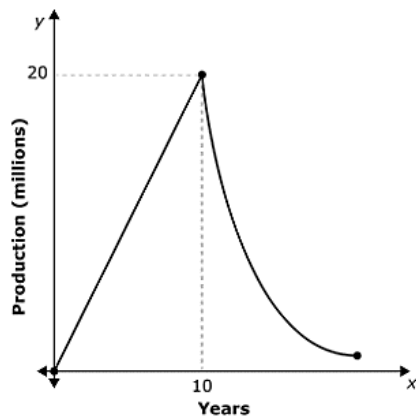
A. $y = 3^x + 23$

B. $y = 23(3x)$

C. $y = 23(3)^x$

D. $y = 3x + 23$

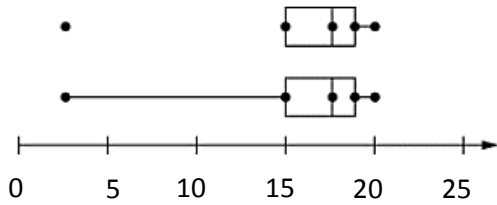
29. Use appropriate math vocabulary to write a situation that could be modeled by the graph.



30. Alex buys and sells books. He determined the amount of money he spent buying books by multiplying the number of books by 64 and adding 70. He figured the amount of money he made selling books by cubing the number of books he sold and subtracting 25. Write a system of equations that represents the situation.

31. A random sample of 10 students were selected to determine how many hours students spend doing homework each week. The data collected is as follows: 5, 10, 13, 10, 12, 13, 15, 16, 13, 12. Construct a box plot that represents the data.

32. Marylou recorded the number of pies she baked on a nightly basis for her bakery and put the data into a box plot. She changed her mind and made a modified box plot of the data. On most days, how many pies did she bake?



33. For each statement, determine whether or not a cause-and-effect relationship is represented.

- A. There is a positive correlation between the number of cold, snowy days and the amount of hot chocolate sold at a ski resort.
- B. There is a negative correlation between the number of miles driven and the amount of gas used.
- C. There is a positive correlation between the number of hours spent exercising and the number of calories burned.
- D. There is a negative correlation between a home-owner's gas bill and the temperature outside.

34. The table shows the weight of an alligator at various times during a feeding trial.

Use a graphing calculator to determine the line of best fit. Round to the nearest hundredth.

Weeks (x)	0	9	18	27	34	43	49
Weight in lbs. (y)	6	8.6	10	13.6	15	17.2	19.8

35. Describe the meaning of the x and y values when a line of best fit has positive slope.
Describe the meaning of the x and y values when a line of best fit has negative slope.

36. A survey was done to determine the relationship between eye color and hair color. A total of 60 students were surveyed to determine the relationship.

		HAIR COLOR				Total
		Black	Brown	Red	Blonde	
EYE COLOR	Brown				1	23
	Blue	2		2	9	21
	Hazel	2	5	1	1	9
	Green	1	3	1	2	7
	Total	12	28	7	13	60

Determine the values that belong in the empty boxes of the two-way frequency table.

37. The chance of being wealthy by age 30 is displayed in the segmented bar graph. Describe whether there is an association between wealth and gender.

