

Algebra 1 Spring District Final REVIEW

For numbers 1 – 6, describe how the graph of $g(x)$ is related to the parent function $f(x)$.

1. $f(x) = 5^x$
 $g(x) = 5^x + 3$

4. $f(x) = x^2$
 $g(x) = -3x^2$

2. $f(x) = 9x$
 $g(x) = 9^{-x}$

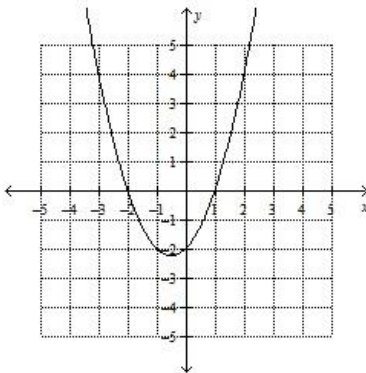
5. $f(x) = x^2$
 $g(x) = (x + 5)^2$

3. $f(x) = 5^x$
 $g(x) = -(5^x)$

6. $f(x) = |x|$
 $g(x) = |x - 8|$

For numbers 7 – 11, select the characteristic that best describes each function.

7.



- a. Absolute minimum
- b. Absolute maximum
- c. Increasing over its domain
- d. Decreasing over its domain

8. $y = -x^2 + 2$

- a. Absolute minimum
- b. Absolute maximum
- c. Increasing over its domain
- d. Decreasing over its domain

9. $f(x) = \left(\frac{1}{4}\right)^x$

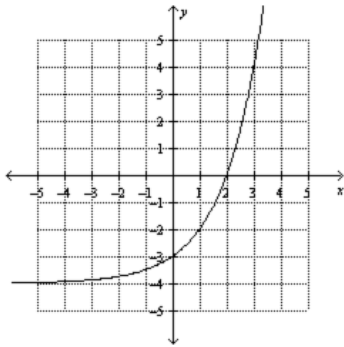
- a. Absolute minimum
- b. Absolute maximum
- c. Increasing over its domain
- d. Decreasing over its domain

10. $y = -2^x - 1$

- a. Absolute minimum
- b. Absolute maximum
- c. Increasing over its domain
- d. Decreasing over its domain

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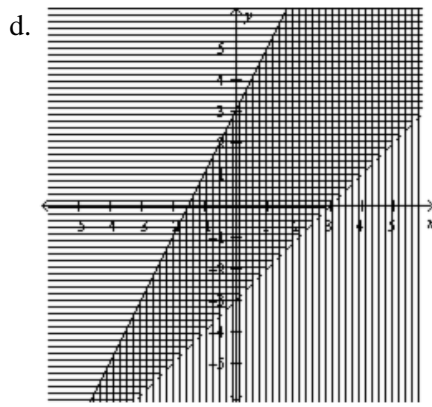
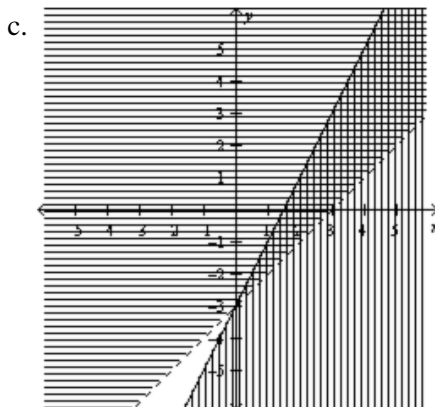
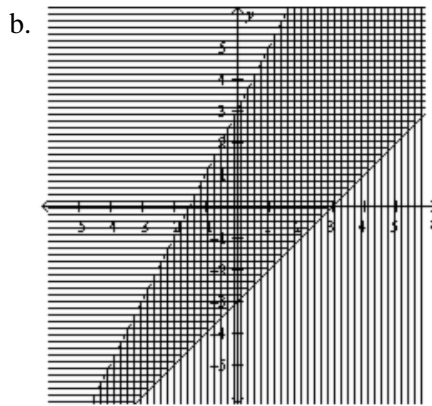
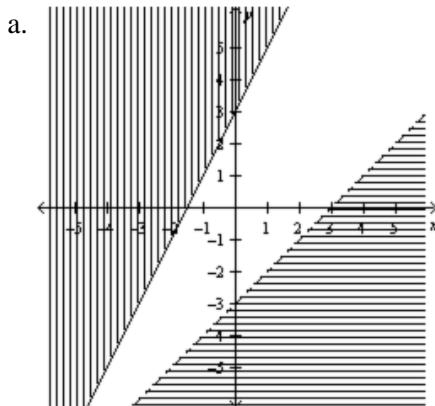
11.



- a. Absolute minimum
- b. Absolute maximum
- c. Increasing over its domain
- d. Decreasing over its domain

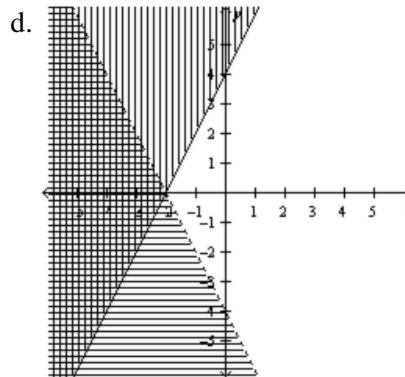
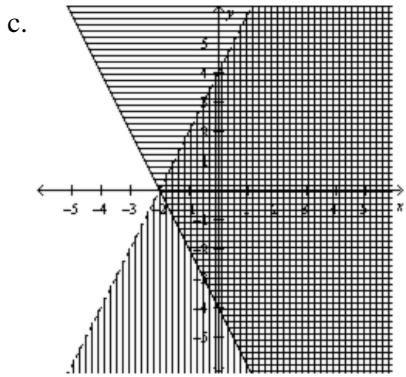
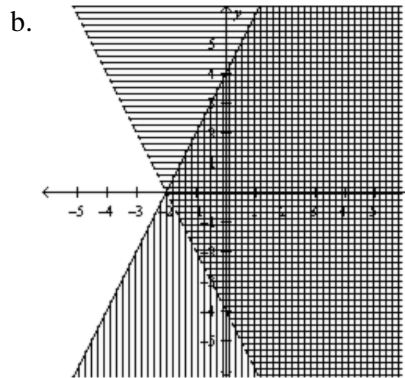
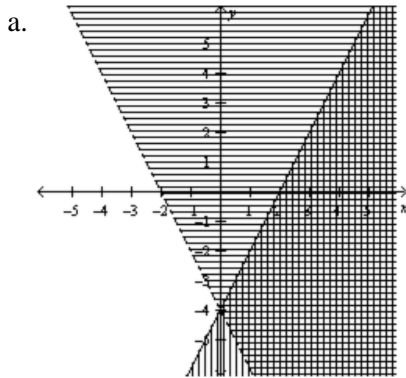
For numbers 12 – 13, solve the system of inequalities by graphing.

12. $y \leq 2x + 3$
 $y > x - 3$



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13. $y \leq 2x + 4$
 $y > -2x - 4$



For numbers 14 – 16, determine the number of solutions the system has.

14. $2x = 2y - 6$
 $y = -x - 1$

- a. no solution
- b. one
- c. two
- d. infinitely many

15. $y = -2x$
 $y = -2x + 5$

- a. infinitely many
- b. two
- c. one
- d. no solution

16. $12x - 3y = 3$
 $y = 4x - 1$

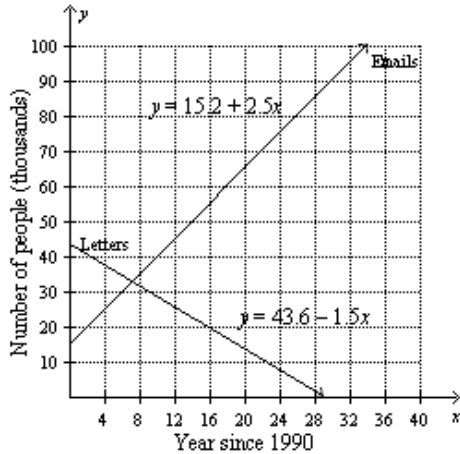
- a. infinitely many
- b. two
- c. one
- d. no solution

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17. In this example data, x is years since 1990 and y is the number of people in thousands using email or letters as the main method of communicating written information.

emails usage: $y = 15.2 + 2.5x$

letters usage: $y = 43.6 - 1.5x$



Estimate the year in which the number of people writing letters equaled the number of people using email.

For numbers 18 – 20, find the next three terms of the sequence. Then determine if it is arithmetic or geometric and write an explicit formula to represent the n^{th} term.

18. 57, 53, 49, 45, . . .

19. -3, 6, -12, 24, ...

20. 4, 12, 36, 108, ...

For numbers 21 – 22, determine whether the data in the table display exponential behavior. Explain why or why not.

21.

x	0	1	2	3
y	0.5	1	2	4

- a. No; the domain values are not at regular intervals.
- b. Yes; the domain values are at regular intervals and the range values have a common factor 1.
- c. Yes; the domain values are at regular intervals and the range values have a common factor 2.
- d. No; the domain values are at regular intervals and the range values have a common sum 0.5.

22.

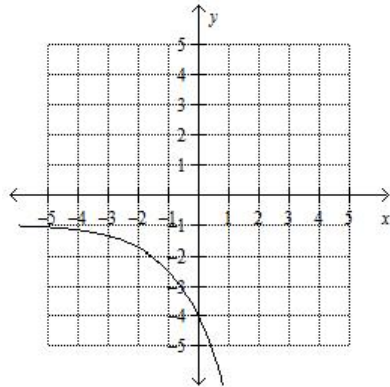
x	3	1	-1	-3
y	1	2	3	4

- a. No; the domain values are at regular intervals and the range values change at a constant rate as well.
- b. No; the domain values are not at regular intervals.
- c. Yes; the domain values are at regular intervals and the range values have a common factor 2.
- d. Yes; the domain values are at regular intervals and the range values have a common sum 1.

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For numbers 23 – 24, find the y-intercept and state the domain and range.

23.



24. $y = 4(3^x)$

25. Write a function that shows the amount of an investment as a function of time in years. \$5,000 is invested at an interest rate of 4.5% compounded monthly for 10 years.

26. A company had a profit of \$823,500 in 2010. This is a 26% increase from 2005. What was the company's profit in 2005? Round to the nearest hundred.

For numbers 27 – 32, simplify. Assume that no denominator is equal to zero.

27. $(-9h^2j^3)(5h^3j^2)$

30. $\sqrt{75y^3z^4}$

28. $\frac{(2a^5b)^3}{32b^4}$

31. $\sqrt{20a^2c^6}$

29. $\left(\frac{2a}{a^2}\right)^{-2}$

32. $10\sqrt{6b} + 8\sqrt{6b}$

For numbers 33 – 34, find the sum or difference.

33. $(5a - 3b^2 - a) + (b - 5 + 8a^2)$

34. $(10p - 4q^2 - q) - (q^2 - 7p + 9p^2)$

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For numbers 35 – 39, find the product.

35. $-2s^4(-3s^5 - 8s - 5)$

38. $(r - 8)(r + 3)$

36. $(-5k + 5)(-5k^2 + 2k - 8)$

39. $(4c + 7)^2$

37. $(6m^2 - 5m + 4)(-4m^2 - 3m - 7)$

For numbers 40 – 44, factor the polynomial.

40. $8g + 16$

43. $5t^2 + 14t + 8$

41. $3x^3 - 15x^2 + 21x$

44. $100v^2 - 169$

42. $x^2 + 6x - 27$

For numbers 45 – 50, solve the quadratic equation by factoring, roots, completing the square, or quadratic formula. Leave answers in reduced radical form, if necessary.

45. $m^2 + 6m = -5$

48. $(x + 4)^2 = 25$

46. $d^2 - 8d + 16 = 11$

49. $s^2 + 14s - 7 = 33$

47. $g^2 - 16g + 14 = 0$

50. $h^2 + 9h - 10 = 0$

For numbers 51 – 52, state the value of the discriminant. Then determine the number of real roots of the equation.

50. $n(7n + 8) = -10$

51. $25x^2 + 10x - 5 = 6$

For numbers 52 – 53, find the vertex of the function.

52. $f(x) = x^2 + 2x + 3$

53. $f(x) = -2x^2 - 16x$

Algebra 1 Spring District Final REVIEW*For numbers 53 – 54, find the zeros of the function.*

53. $y = 2x^2 + 4x$

54. $y = x^2 + 2x + 3$

For numbers 55 – 58, graph the function.

55. $f(x) = x^2 + 6x + 8$

57. $f(x) = x^2 + 3x - 2$

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

58. $y = -x^2 + 4$

For numbers 59 – 60, solve the system of equations by graphing.

59. $y = -x^2 + 4x + 2$
 $y = x + 2$

60. $y = x^2 + 3x - 4$
 $y = -x - 4$

For numbers 61 – 62, find the lower and upper quartile for the given data.

61. A dance recital was performed at a local theater with 8 dancers competing. Each dancer received a score from 0 through 10, with 10 being the highest.

Dancer	Score
April	8.5
Natalie	8.4
Paul	7.9
Olivia	9.4
Kristin	9.1
Justin	8.7
Courtney	6.3
Ashley	7.6

62. The top speed of 10 different animals is listed in the table. The fastest speed is the Peregrine falcon traveling at 242 miles per hour.

Animal	Speed (Miles per Hour)
Peregrine falcon	242
Horsefly	90
Pronghorn	55
Ostrich	60
Swordfish	59
Golden Eagle	190
Cheetah	68
Sailfish	67
Frigatebird	95
Lion	50

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For numbers 63 – 64, draw a dot plot for each set of data.

63. 1, 5, 2, 3, 4, 1, 0, 4, 5, 4, 2, 4

64. 0, 3, 1, 3, 1, 2, 1, 5, 2, 0, 1, 2

For numbers 65 – 66, display the set of data in a cumulative frequency histogram.

65.

Students' Pets		
Number of Pets	Tally	Frequency
0-1		2
2-3		1
4-5		1
6-7		2
8-9		3

66.

Daily Low Temperatures in January		
Temperature (°F)	Tally	Frequency
0 – 9		1
10 – 19	/	13
20 – 29	/	9
30 – 39	/	8
40 – 49	/	12

For numbers 67 – 68, describe the center and spread of the data using either the mean and standard deviation or the five-number summary. Justify your choice.

67. 9, 1, 29, 10, 5, 39, 29, 4, 24, 8, 3, 33, 13, 32, 23, 32, 39, 10, 18, 26, 26, 10, 9, 18, 15, 17, 12, 18, 9, 15, 9, 24, 12, 22, 20, 15

68. The tables show the number of points scored by the Red Hawks this season.

Red Hawks Points Scored							
42	59	50	37	36	43	44	38
40	56	49	52	46	47	55	31

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For questions 69 – 70, refer to the data below.

Mr. Bryant is trying to figure out which class project to work on for community service. He surveyed the junior and senior students about their preferred project. The frequency table shows the responses of the students.

	Juniors	Seniors	Total
Park Cleanup	30	26	56
Food Kitchen	50	34	84
Clothing Drive	10	50	60
Total	90	110	200

69. How many more Seniors want to work a clothing drive than Juniors?

70. Of the juniors, how many students are wanting to work in the food kitchen.

71. Franklin is making a bar graph using the data in the frequency table. How many times higher will the summer bar be than the fall bar?

Favorite Season	Tally	Frequency
Winter		12
Spring		18
Summer		45
Fall		9