

Chapter 1

Notations

1. Graph the following sets of numbers on a number line. Are any of the sets the same?

A. $(2,10]$

B. $\{x \mid 2 \leq x \leq 10\}$

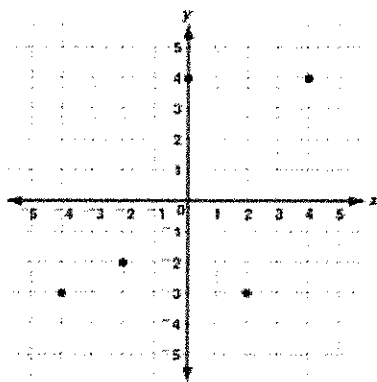
C. $\{2,3,4,5,6,7,8,9,10\}$

Relations & Functions

2. Domain: _____

Range: _____

Is it a function? _____



3. Domain: _____

Range: _____

Is it a function? _____

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

4. Domain: _____

Range: _____

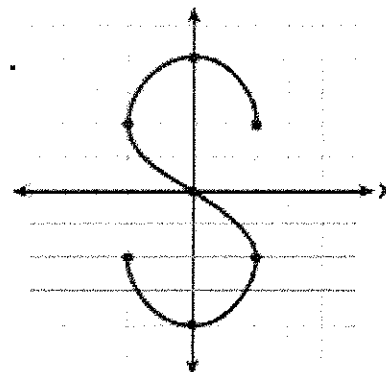
Is it a function? _____

| | | | |
|-----|----|----|---|
| x | 4 | 5 | 6 |
| y | 12 | 12 | 4 |

5. Domain: _____

Range: _____

Is it a function? _____



6. Use the graph at the right to answer the following.

a. What is the domain of $f(x)$? _____

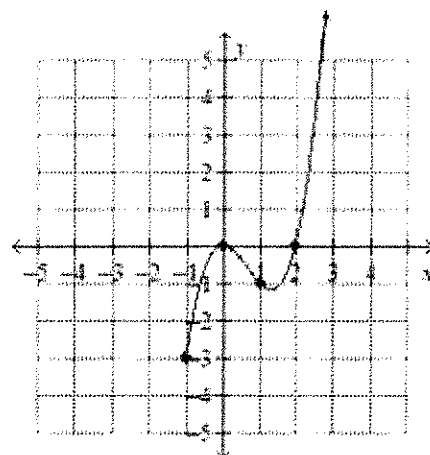
b. What is the range of $f(x)$? _____

c. What is the value of $f(1)$? _____ $f(2)$? _____

d. For what values of x is $f(x)$ at its minimum? _____

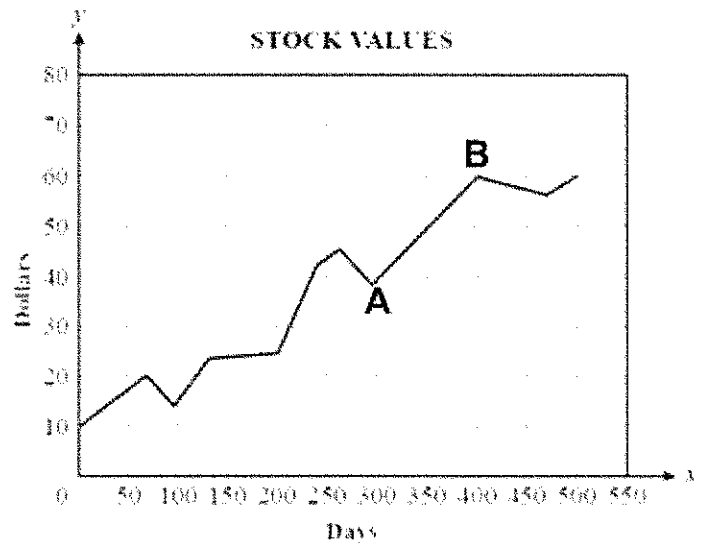
e. The relation is a function because it passes the

_____ test.



7. Based on the graph, which of the following best describes the range of the value of stock for this 500 day period?

- A. $0 \leq x \leq 500$
- B. $1 \leq x \leq 500$
- C. $10 \leq y \leq 60$
- D. $0 < v < 10$



8. At what day was the stock value \$50? _____
9. What is the approximate slope of the section of the line from point A to point B?

Algebraic Expressions (with percents)

10. A house is for sale and the asking price is p dollars. Erin put an offer on the house that was 10% less than the asking price. Write an expression for the difference between the asking price and Erin's offer.
- A. $0.01p$ B. $0.1p$ C. $1.1p$ D. $0.90p$
11. Since last year, the price of beef dropped 4%. Which expression shows the new price of beef? (the old price is represented by b)
- A. $0.04b$ B. $b - 0.04$ C. $b - 1.04$ D. $b - .04b$
12. This year's model of a cell phone is 5% heavier than last year's. Which expression shows the weight of the new model (w represents the weight of last year's model).
- A. $w + 0.05$ B. $0.05w$ C. $w + 1.05$ D. $1.05w$
13. The width of a rectangular classroom is w feet. The length of the room is twice the width.

- a. Write an expression for the perimeter of the room.

- b. Write an expression for the area of the room.

14. The width of a rectangular classroom is w feet. The length of the room is 10 feet longer than its width.

- a. Write an expression for the perimeter of the room.

- b. Write an expression for the area of the room.

Function Notation

15. Given the functions $f(x) = -3x^2 - x$ and $g(x) = 6x - 10$.

a. Evaluate $f(-4)$

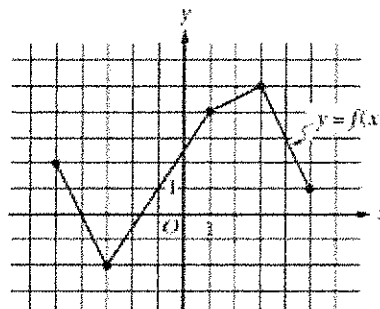
b. Evaluate $g(\frac{2}{3})$

16. Use the graph at the right to find the following.

a. What is $f(1)$? _____ b. $f(-4)$? _____

c. For what value of x is $f(x)$ at its minimum? _____

d. For what value(s) of x is $f(x) = 1$? _____



Chapter 2 Linear Equations/Inequalities

Proportional Reasoning Write a proportion and solve.

17. While on a school trip to Germany, Hank bought a jacket for 68 euro. At the time, the exchange rate was 0.90 euro equal to one U.S. dollar. How much did Hank pay in U.S. dollars for the jacket?

18. In preparation for her vacation to Mexico, Mrs. Johnson exchanged \$500 U.S. dollars for pesos. At the time, the exchange rate was 1 U.S. dollar = 18.66 pesos.. What was the total value of her money in pesos?

19. Jill walked 30 meters in 26.3 seconds. If she walks this same rate, which of the following is closest to the distance she'll walk in three minutes?

20. Sydney ran 324 feet in 16.2 seconds. At this rate, how far will she run in five minutes?

- A) 160 m
- B) 180 m
- C) 200 m
- D) 220 m

Find the x-intercept & y-intercept of a line.

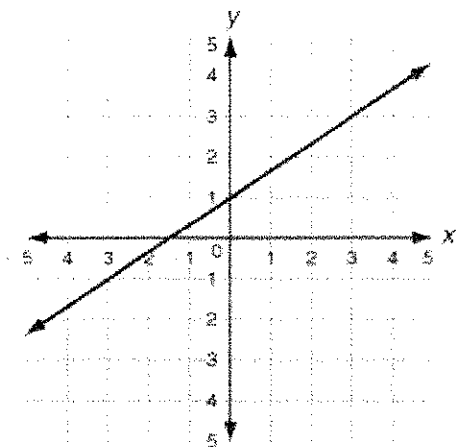
21. Find the x - intercept and y - intercept of the line $\frac{1}{2}x - 3y = 9$

22. Find the x - intercept and y - intercept of the line $y = -4x + 8$

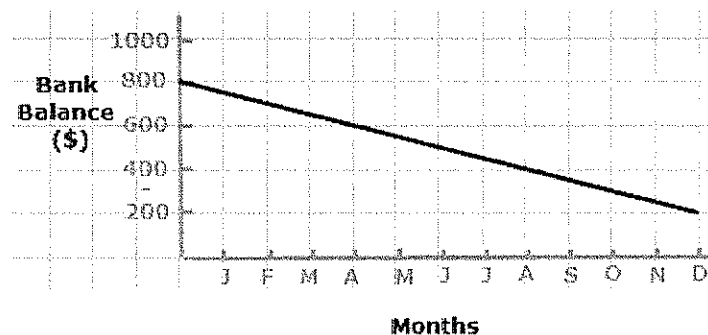
Write the linear function from a graph, table, ordered pairs.

23. Write a linear equation/inequality for each.

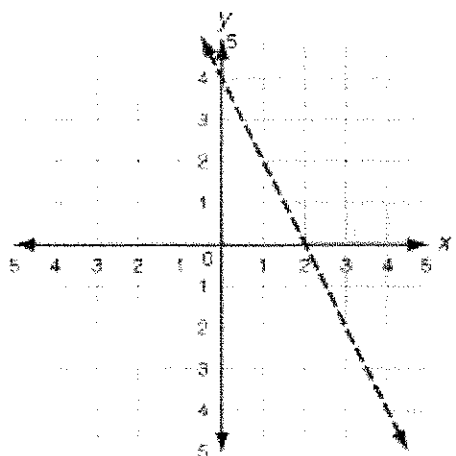
a.



b.



c.



d.

| Time (min) | Altitude (feet) |
|------------|-----------------|
| 0 | 15,000 |
| 1 | 13,000 |
| 2 | 11,000 |
| 3 | 9,000 |
| 4 | 7,000 |
| 5 | 5,000 |

e. $x = 3$ is a _____ line with _____ slope

$y = -2$ is a _____ line with _____ slope

24. Write a linear function, $f(x)$, where $f(-2) = -5$ and $f(1) = 1$.

25. Write a linear function to model the data:

A child's cough medicine has a dosage table on the package.

| Medicine Dosage | |
|---------------------|-------------|
| Child's Weight (kg) | Dosage (mL) |
| 10 | 6.0 |
| 16 | 7.5 |
| 28 | 10.5 |
| 30 | 11.0 |

26. Write the equation of a line parallel to $y = \frac{3}{2}x + 6$ and passing through $(4,5)$.

27. Write the equation of a line that passes through $(-2, 5)$ and is perpendicular to the line passing through $(-2, 5)$ and $(2, 3)$.

28. Determine if the pair of lines is parallel, perpendicular, or neither.

$$-3x + 4y = 15$$

$$9x - 12y = 24$$

29. Determine if the following pairs of lines are parallel, perpendicular, or neither.

a. $y = 5$
 $y = -\frac{1}{5}$

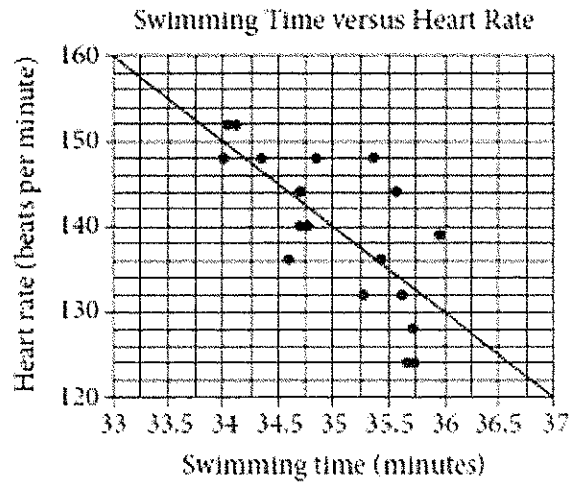
b. $y = -2x$
 $y = -2$

c. $x = -4$
 $x = -\frac{1}{4}$

d. $y = \frac{1}{2}$
 $y = -2$

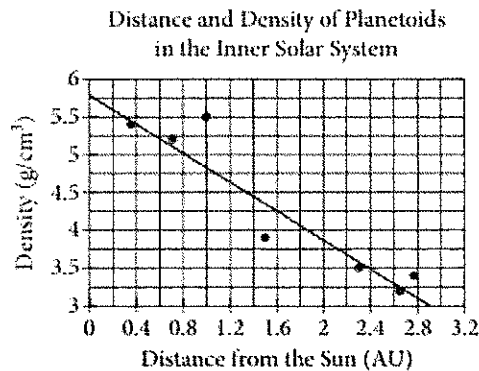
30. Michael swam 2,000 yards on each of eighteen days. The scatterplot above shows his swim time for and corresponding heart rate after each swim. The line of best fit for the data is also shown. For the swim that took 34 minutes, Michael's actual heart rate was about how many beats per minutes less than the rate predicted by the line of best fit?

- A) 1
- B) 2
- C) 3
- D) 4



31. An astronomer has discovered a new planetoid about 1.0 AU from the Sun. According to the line of best fit, which of the following best approximates the density of the planetoid, in grams per cubic centimeter?

- A. 4.8
- B. 5.5
- C. 5.8
- D. 4.5



Solving & Graph Compound Inequalities ("OR" versus "AND")

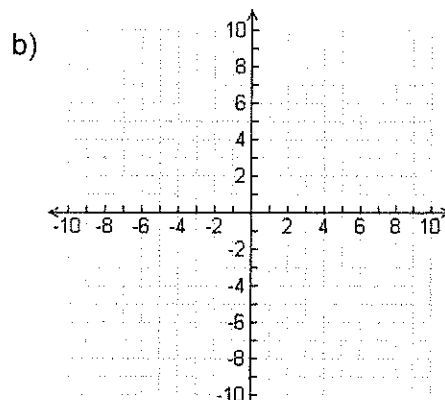
32. $-2x + 4 > 10$ or $x - 3 > 7$

33. $-4 \leq 2x + 6$ and $5x + 6 < 3x + 8$

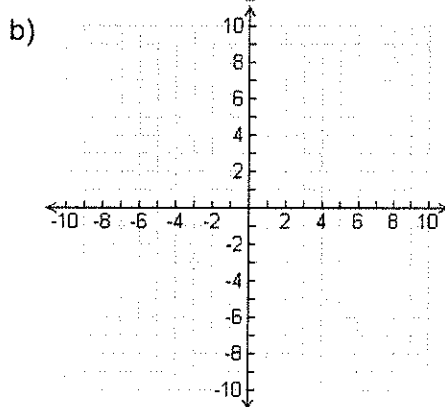
Chapter 3 Solving Systems of Equations

Solve each system of linear equations using two methods: a) use substitution or elimination b) graph both lines Write each solution as an ordered pair!

34. $y = -3x - 1$ a)
 $2x - y = 6$



35. $3x + 2y = 6$ a)
 $x - 4y = 16$



Use Substitution or Elimination to solve the systems. Then find the value of $x - y$.

36. $x = y - 7$
 $\frac{x}{2} + 4y = 10$

37. $y = 4x - 1$
 $y = -2x + 5$

38. $2x + 3y = 6$
 $4x + 6y = 12$

39. $5x + 2y = 10$
 $10x + 4y = 30$

Set up a system of equations and solve.

40. Tables must be rented for a banquet to seat all the guests. A large table seats 12 and costs \$50. A small table seats 8 and costs \$25. How many of each type of table must be rented to seat 100 guests for \$350?
41. I bought 32 peanut butter and chocolate chip cookies and spent \$84. If peanut butter cookies cost \$2 and chocolate chip cookies cost \$3, how many peanut butter cookies did I buy?
42. Leyla is selling hot dogs and spicy sausages at the fair. She has only 40 buns, so she can sell no more than a total of 40 hot dogs and spicy sausages. Each hot dog sells for \$2, and each sausage sells for \$2.50. Leyla needs at least \$90 in sales to meet her goal. Write a system of inequalities that models this situation. You do not need to solve.
43. In the xy -plane, the equations $5x + ky = 7$ and $-10x + 6y = -14$ represent the same line for some constant k . What is the value of k ?
44. Given the system, what is the value of $2x + y$?
- $$-x + y = -3.5$$
- $$x + 3y = 9.5$$

45. Which of the following ordered pairs satisfies the system below?
(more than one correct answer)

$$\begin{aligned} y &\geq -2x + 5 \\ x - y &< 4 \end{aligned}$$

- A. (6, 1)
B. (3, -1)
C. (8, 5)
D. (3, 0)
E. (5, 2)

46. A laundry service is buying detergent and fabric softener from its supplier. The supplier will deliver no more than 300 pounds in a shipment. Each container of detergent weighs 7.35 pounds, and each container of fabric softener weighs 6.2 pounds. The service wants to buy at least twice as many containers of detergent as containers of fabric softener. Let d represent the number of containers of detergent, and let s represent the number of containers of fabric softener, where d and s are nonnegative integers. Which of the following systems of inequalities best represents this situation?

- A) $7.35d + 6.2s \leq 300$
 $d \geq 2s$
B) $7.35d + 6.2s \leq 300$
 $2d \geq s$
C) $14.7d + 6.2s \leq 300$
 $d \geq 2s$
D) $14.7d + 6.2s \leq 300$
 $2d \geq s$

Chapter 5 Quadratics

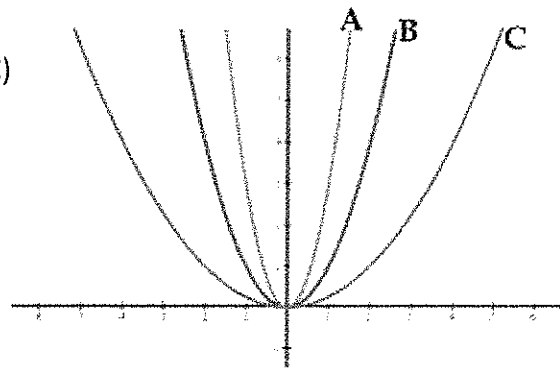
Transformations of Parent Function $f(x) = x^2$

47. Match the function with the graph. (Choose A, B, or C)

$$f(x) = x^2 \quad \underline{\hspace{2cm}}$$

$$g(x) = \frac{1}{4}x^2 \quad \underline{\hspace{2cm}}$$

$$h(x) = 3x^2 \quad \underline{\hspace{2cm}}$$



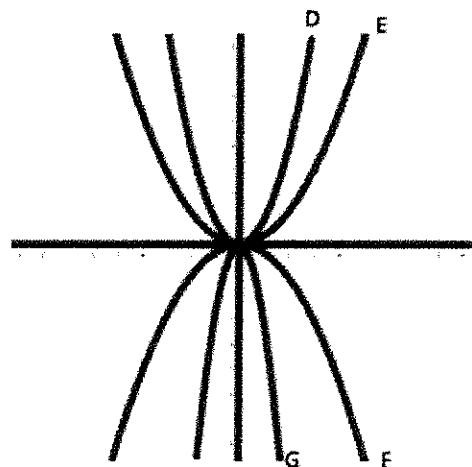
48. Graph D represents the parent function $f(x) = x^2$.

Match the remaining graphs to the equations below.

$$f(x) = -\frac{1}{3}x^2 \quad \underline{\hspace{2cm}}$$

$$f(x) = \frac{1}{3}x^2 \quad \underline{\hspace{2cm}}$$

$$f(x) = -3x^2 \quad \underline{\hspace{2cm}}$$



Describe the transformation of the parent graph $f(x) = x^2$.

49. $f(x) = (x - 3)^2 + 2$ is a _____
50. $f(x) = -2x^2$ is a _____

51. The function $g(x) = (x - 3)^2 - 2$ is the translated image of $f(x) = (x + 2)^2 - 4$. Describe the translation that takes $f(x)$ to $g(x)$. _____

52. Let $h(x) = 3(x - 1)^2 + 2$ and $j(x) = -3(x - 5)^2 - 1$. Describe the translation that takes $h(x)$ to $j(x)$. _____

53. The equation $f(x) = 3x^2 - 6x + 5$ is graphed. The functions $g(x)$ and $h(x)$ are transformations of $f(x)$. Describe the transformation.

a. $g(x) = 3x^2 - 6x - 1$. _____

b. $h(x) = 3x^2 - 6x + 8$? _____

3 Forms of Quadratic Functions (standard, vertex, & factored)

54. The equations below represent a parabola in the xy plane. These equations are all equivalent. Identify the form (vertex, standard, factored) and state what is displayed by that form.

a. $y = x^2 - 6x + 8$ Form: _____ Displays: _____

b. $y = (x - 3)^2 - 1$ Form: _____ Displays: _____

c. $y = (x - 2)(x - 4)$ Form: _____ Displays: _____

55. The function f is defined by $f(x) = (x + 6)(x - 8)$. The graph of f in the xy plane is a parabola. What is the vertex of the parabola?

56. For the function $g(x) = (x + 2)^2 - 3$, graph & find the:

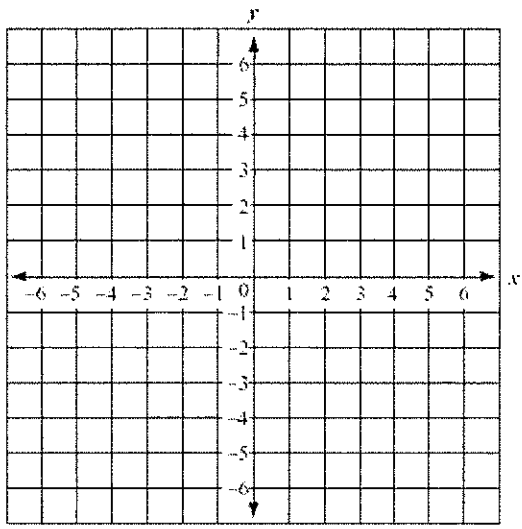
_____ Vertex _____ Axis of Symmetry

_____ y-int _____ max/min value

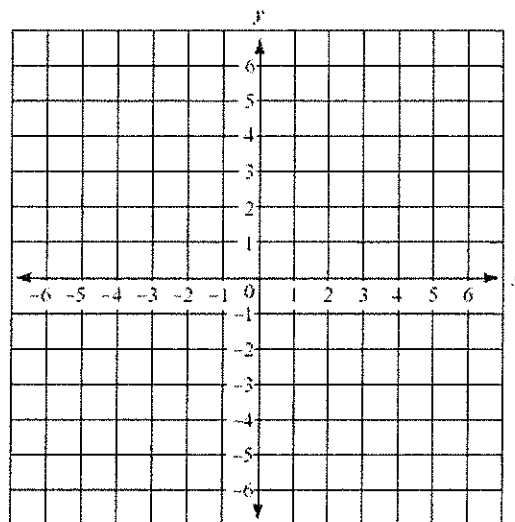
_____ Domain _____ Range

5 points on the graph:

_____, _____, _____, _____, _____



57. For the function $f(x) = -2x^2 + 4x + 1$, graph & find the:



_____ Vertex _____ Axis of Symmetry

_____ y-int _____ max/min value

_____ Domain _____ Range

5 points on the graph: _____, _____, _____, _____, _____

Solving Quadratic Equations (solve, find the solutions, find the roots, find the zeros)

(3 methods: factoring, square roots, Quadratic Formula)

58. Find the solutions to $3x^2 + 4x = -3$

59. Find the roots of the function $h(x) = 2x^2 + 8$

Use square roots to solve.

60. $(x + 3)^2 = 25$

61. $(x - 5)^2 + 26 = 10$

62. $\frac{1}{2}(x - 2)^2 = 32$

63. If a is a solution to the equation $12x^2 + 10x = 12$ and $a > 0$, what is the value of a ?

64. The function $f(x) = 2x^2 - 7x - 4$ is graphed on the coordinate plane. What are the x -intercepts of this functions?

65. $g(x) = ax^2 + 2x + 1$

For the function g defined above, a is a constant and $g(3) = -11$. Find $g(-1)$.

66. If a quadratic equation has the given discriminant ($b^2 - 4ac$), tell the number of roots and the types.

Discriminant of -6 has _____

Discriminant of 0 has _____

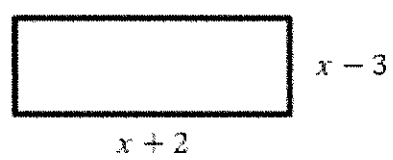
Discriminant of 8 has _____

Discriminant of 9 has _____

- | |
|--|
| Choices are: A. 1 rational, real root B. 2 rational, real roots C. 2 irrational, real roots D. 2 nonreal (imaginary) roots |
|--|

Applications of Quadratic Functions

67. The area of the rectangle is 50 square feet. Find the dimensions of the rectangle.



68. If a rocket is launched, and it is modeled by the equation $h(t) = -20t^2 + 300t + 5$. What is the initial height? _____ When will it hit the ground? _____

69. A projectile with the equation below reaches its maximum height at 1.6 seconds. What is the maximum height it reaches? _____ (in feet)

$$h(t) = -20t^2 + 64t + 16$$

70. Marsha hits a tennis ball upward from the top of a 96-foot high cliff with an initial velocity of 16ft/s. The general function that approximates the height, h , in feet of a projectile on Earth after t seconds is $h(t) = -16t^2 + v_0t + h_0$.
- a. Write the function. _____ Sketch:
- b. How many seconds will it take for the ball to hit the ground? _____
- c. The maximum height the ball will reach is _____ feet, and it occurs at _____ seconds.
- d. What is the height of the ball at 1 second? _____

Imaginary & Complex Numbers

Simplify.

71. $(-2 + i) - (5 - 6i)$

72. $(-2 + i)(5 - 6i)$

73. $(x - 3i)(x + 3i)$

74. How many real solutions will there be for each equation below? Find the solutions for each.

a. $3x^2 - 9 = 0$

b. $3x^2 + 9 = 0$

A rocket is launched. $h(t)$ is the height in meters of the rocket t seconds after it is launched. For each, find the...

| | 75. $h(t) = -5t^2 + 15t$ | 76. $h(t) = -5t^2 + 15t + 20$ | 77. $h(t) = -5t^2 + 20t + 12$ |
|---|--------------------------|-------------------------------|-------------------------------|
| a) initial height. *include units! | | | |
| b) maximum height *include units! | | | |
| c) time that it takes the rocket to hit the ground *include units! | | | |

Solving Absolute Value Equalities/Inequalities (January Lesson)

78. $|3x + 2| = 5$

79. $3|-2x| + 6 = 24$

80. $|x| + 5 = 3$

Solve and GRAPH on a number line.

81. $3|x - 2| > 15$

GreatOR

LessthAND

82. $|2x + 1| \leq 9$

83. For what value of n is $|n| - 1 = 0$ equal to 0?

A) only 1

B) 1 and -1

C) only -1

D) There is no such value of n .

84. For what value of n is $|n| + 1 = 0$ equal to 0?

A) 0

B) 1

C) -1

D) There is no such value of n .

85. For what value of n is $|n - 3| + 1 = 0$ equal to 0?

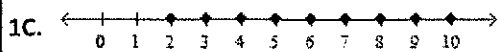
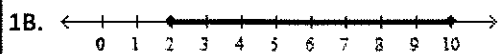
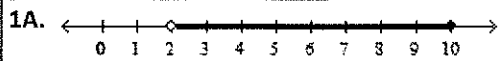
A) 2

B) 3

C) 4

D) There is no such value of n .

Alg 2 Exam Review ANSWERS



none are the same

2. D: $\{-4, -2, 0, 2, 4\}$, R: $\{-3, -2, 4\}$, yes
 3. D: $\{0, 2, 3\}$, R: $\{-2, -1, 1, 2\}$, no
 4. D: $\{4, 5, 6\}$, R: $\{4, 12\}$, yes
 5. D: $\{x \mid -2 \leq x \leq 2\}$ or $[-2, 2]$, R: $\{y \mid -4 \leq y \leq 4\}$ or $[-4, 4]$, no
 6a. $x \geq -1$ or $[-1, \infty)$ 6b. $y \geq -3$ or $[-3, \infty)$
 6c. $f(-1)=1; f(2)=0$ 6d. $x = -1$ 6e. vertical line
 7. C

8. 350 days

9. $1/5$

10. B 11. D 12. D

13a. $6w$ 13b. $2w^2$

14a. $4w + 20$ 14b. $w^2 + 10w$

15a. $f(-4) = -44$ 15b. $g(\frac{2}{3}) = -6$

16a. 4 b. 0 c. -3 d. 5, -1, $-4\frac{1}{2}$

17. \$69,39

18. 9,330 pesos

19. C

20. 6,000 ft

21. (18, 0) and (0, -3)

22. (2, 0) and (0, 8)

23a. $y \leq \frac{2}{3}x + 1$ 23b. $y = -50x + 800$

23c. $y > -2x + 4$ 23d. $y = -2000x + 15,000$

23e. $x = 3$ is vertical, undefined
 $y = -2$ is horiz, 0 slope

24. $y = 2x - 1$

25. $y = \frac{1}{4}x + \frac{7}{2}$

26. $y = \frac{3}{2}x - 1$

27. $y = 2x + 9$

28. parallel (both slopes = $\frac{3}{4}$)

29a. parallel (both horiz)

29b. Neither (one is falling, one is horiz)

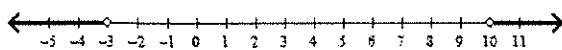
29c. parallel (both vertical)

29d. parallel (both horiz)

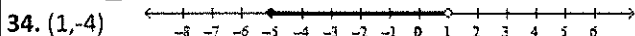
30. B

31. A

32. $x < -3$ OR $x > 10$



33. $-5 \leq x < 1$



35. (4, -3)

36. (-4, 3); $x - y = -7$

37. (1, 3); $x - y = -2$

38. infinite # solns

39. \emptyset

40. 3 large & 8 small

41. 12 peanut butter

42. $h + s \leq 40$
 $2h + 2.5s \geq 90$

43. -3

44. 11.5

45. C, D, E

46. A

47. B, C, A

48. F, E, G

49. translation horizontally (rt) 3 and vertically (up) 2

50. reflection over x-axis and vertical stretch by factor of 2

51. translation horizontally (rt) 5, vertically (up) 2

52. reflection over x-axis & translation rt 4, down 3

53a. Down 6 b. up 3

54. a. standard form, displays y - int (0, 8)

b. vertex form, displays *vertex* (3, -1)

c. factored form, displays *roots* 2 and 4

55. (1, -49)

56. vertex (-2, -3), AOS $x = -2$, y-int (0, 1), min -3,
D: all real, R: $y \geq -3$

57. vertex (1, 3), AOS $x = 1$, y-int (0, 1), max 3, *D: all real,*
R: $y \leq 3$

58. $-\frac{2}{3} \pm \frac{i\sqrt{5}}{3}$

59. $\pm 2i$

60. 2 & -8

61. $5 \pm 4i$

62. 10 & -6

63. $\frac{2}{3}$

64. $(-\frac{1}{2}, 0)$ and (4, 0)

65. $g(-1) = -3$

66. D, A, C, B

67. 10ft x 5ft

68. ≈ 15.0 sec

69. 67.2 feet

70 a. $h(t) = -16t^2 + 16t + 96$

b. 3 sec

c. 100 ft at 0.5 sec

D. 96 ft

71. $-7 + 7i$

72. $-4 + 17i$

73. $x^2 + 9$

74a. 2 real ($\pm\sqrt{3}$) 74b. 0 real ($\pm i\sqrt{3}$)

75a. 0 b. 11.25 m c. 3 s

76a. 20 m b. 31.25 m c. 4 s

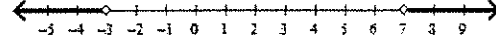
77a. 12 m b. 32 m c. 4.53 s

78. $x = 1$ or $-\frac{7}{3}$

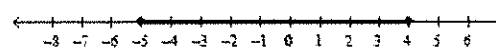
79. $x = -3$ or 3

80. \emptyset

81. $x < -3$ or $x > 7$



82. $-5 \leq x \leq 4$



83. B

84. D 85. D