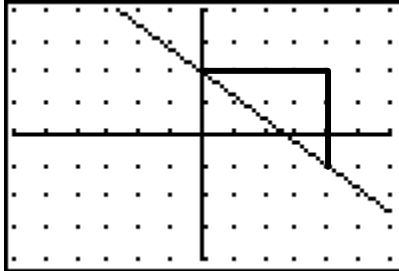


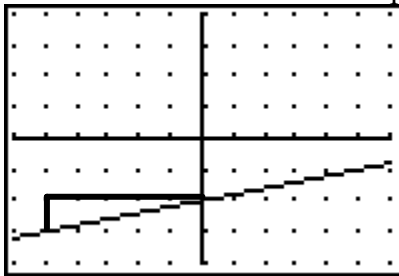
## Chapter 2

1. Use the graph of the linear function to write the equation for the line in standard form  $Ax + By = C$ ,  $A \geq 0$ . Each tick mark on the horizontal and vertical axes represents one unit.



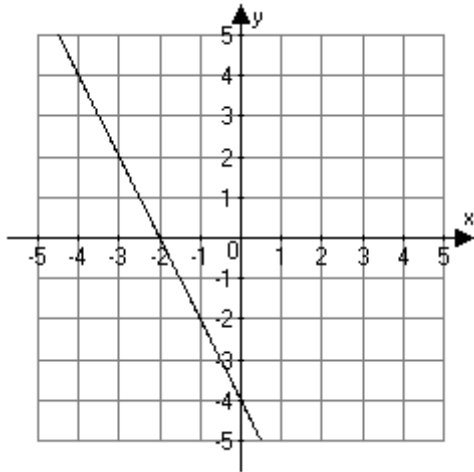
- A)  $3x - 4y = -8$    B)  $3x + 4y = 4$    C)  $3x + 4y = 8$    D)  $3x - 4y = 2$

2. Use the graph of the linear function to find the rise, run and slope. Each tick mark on the horizontal and vertical axes represents one unit.



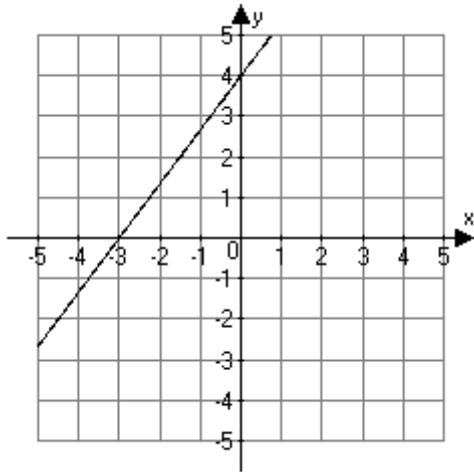
- A) rise = 1; run = 5; slope =  $1/5$                       C) rise = 2; run = 5; slope =  $2/5$   
B) rise = 5; run = 1; slope = 5                      D) rise =  $1/5$ ; run = 5; slope = 5

3. Use the graph of the linear function to find the  $x$ -intercept,  $y$ -intercept and slope.



- A)  $x$ -intercept =  $-2$ ;  $y$ -intercept =  $-4$ ; slope =  $2$
- B)  $x$ -intercept =  $-2$ ;  $y$ -intercept =  $-4$ ; slope =  $-2$
- C)  $x$ -intercept =  $-4$ ;  $y$ -intercept =  $-2$ ; slope =  $-2$
- D)  $x$ -intercept =  $-2$ ;  $y$ -intercept =  $-3$ ; slope =  $3/2$

4. Use the graph of the linear function to find the  $x$ -intercept,  $y$ -intercept and slope.



- A)  $x$ -intercept =  $-3$ ;  $y$ -intercept =  $4$ ; slope =  $-4/3$
- B)  $x$ -intercept =  $4$ ;  $y$ -intercept =  $-3$ ; slope =  $3/4$
- C)  $x$ -intercept =  $-3$ ;  $y$ -intercept =  $4$ ; slope =  $4/3$
- D)  $x$ -intercept =  $-3$ ;  $y$ -intercept =  $3$ ; slope =  $1$

5. Which of the equations below define linear functions?

i)  $y = 9x^4$

ii)  $y = -8x + 4^3$

iii)  $y = -\frac{9}{10}(5x - 12)$

iv)  $y = \frac{9}{x} + 4$

A) iii    B) ii and iv    C) i, iii, iv    D) ii and iii

6. Write the equation of the line described.

Vertical, goes through  $(-8, 2)$

A)  $x = 2$     B)  $x = -8$     C)  $y = -8$     D)  $y = 2$

7. Write the equation of the line described.

Goes through  $(-6, -4)$  and  $(-6, 8)$

A)  $y = -6$     B)  $y = -4$     C)  $x = 8$     D)  $x = -6$

8. Write the equation of the line described.

Goes through  $(1, 2)$  and  $(-5, 2)$

A)  $y = 2$     B)  $y = 1$     C)  $x = -5$     D)  $x = 1$

9. Write the slope-intercept form of the equation of the line with the indicated slope and y-intercept.

Slope =  $-7$ ; y-intercept =  $1$

A)  $y = -7x + 1$     B)  $y = x - 7$     C)  $y = -7x - 1$     D)  $y = x + 7$

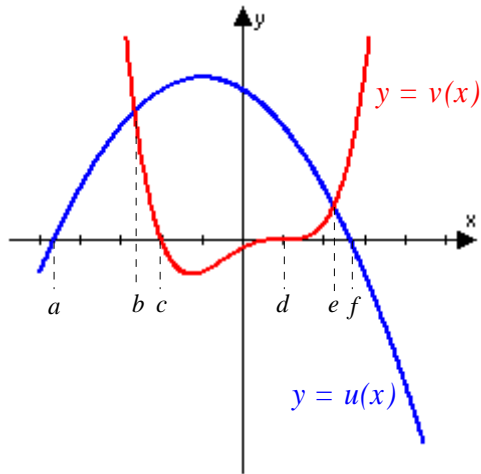
10. Write the standard form  $Ax + By = C$  of the equation of the line with the indicated slope and y-intercept, where  $A$ ,  $B$ , and  $C$  are integers, and  $A \geq 0$ .

Slope =  $\frac{9}{4}$ ; y-intercept =  $-3$

A)  $9x - 4y = 12$     B)  $9x - 4y = -12$     C)  $9x + 4y = 12$     D)  $9x + 4y = -12$

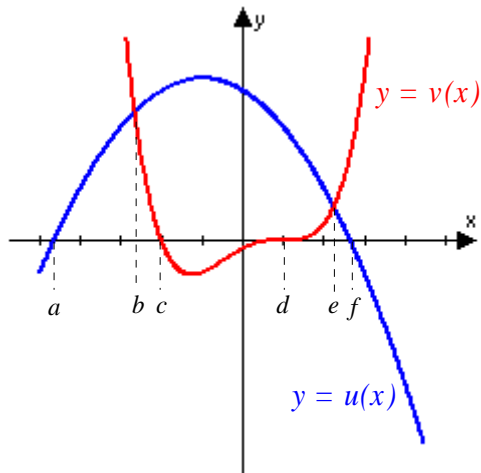
11. Find an equation for the line that has slope  $\frac{5}{8}$  and passes through the point  $(-1, -2)$ .  
Write your answer in slope-intercept form.
- A)  $y = \frac{5}{8}x - \frac{11}{8}$       C) No such line exists.  
B)  $y = \frac{5}{8}x - 2$       D) There is more than one such line.
12. Find the equation of the line that goes through  $(3, 9)$  and  $(6, -5)$ . Write your answer in slope-intercept form.
- A)  $y = \frac{14}{3}x + 23$     B)  $y = -\frac{14}{3}x + 23$     C)  $y = -\frac{14}{3}x - 23$     D)  $y = \frac{14}{3}x - 23$
13. Find the equation of the line that has  $x$ -intercept 7 and  $y$ -intercept 6. Write your answer in slope-intercept form.
- A)  $y = \frac{6}{7}x - 6$     B)  $y = -\frac{6}{7}x - 6$     C)  $y = -\frac{6}{7}x + 6$     D)  $y = \frac{6}{7}x + 6$
14. Write the equation of the line parallel to the line  $3x + 6y = 12$  and passing through the point  $(-1, 4)$ . Write the final equation in the slope-intercept form  $y = mx + b$ .
- A)  $y = -\frac{1}{2}x + 2$     B)  $y = -\frac{1}{2}x + 1$     C)  $y = -\frac{1}{2}x + \frac{7}{2}$     D)  $y = -2x + 2$
15. Which of the following equations is a line that goes through the point  $(2, -3)$  and is also perpendicular to the line  $y = -\frac{1}{3}x$ .
- A)  $y = 6x - 9$     B)  $y = -3x + 2$     C)  $y = 3x - 9$     D)  $y = 3x + 2$
16. Find the linear function  $f$  whose graph passes through the points  $(3, -6)$  and  $(6, 7)$ .
- A)  $f(x) = -\frac{13}{3}x - 19$       C)  $f(x) = \frac{13}{3}x + 19$   
B)  $f(x) = \frac{13}{3}x - 19$       D)  $f(x) = -\frac{13}{3}x + 19$

17. Use the graphs of  $u$  and  $v$  to solve  $v(x) = 0$ .



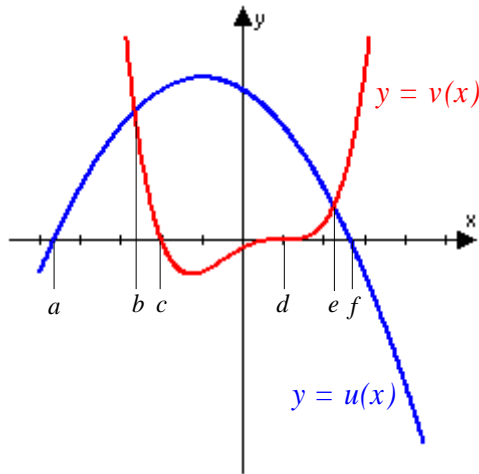
- A)  $x = c$  and  $x = d$    B)  $x = b$  and  $x = e$    C)  $x = 0$    D)  $x = a$  and  $x = f$

18. Use the graphs of  $u$  and  $v$  to solve  $u(x) = v(x)$ .



- A)  $x = c$  and  $x = d$    B)  $x = b$  and  $x = e$    C)  $x = 0$    D)  $x = a$  and  $x = f$

19. Use the graphs of  $u$  and  $v$  to solve  $u(x) - v(x) = 0$ .



- A)  $x = c$  and  $x = d$    B)  $x = b$  and  $x = e$    C)  $x = 0$    D)  $x = a$  and  $x = f$

20. Classify the equation as an identity, conditional equation, or a contradiction.

$$15(x - 9) - 14(x - 3) = x - 93$$

- A) identity   B) conditional equation   C) contradiction

21. Classify the equation as an identity, conditional equation, or a contradiction.

$$5(x + 5) + 6(-2 - x) = -2x + 5$$

- A) identity   B) conditional equation   C) contradiction

22. Classify the equation as an identity, conditional equation, or a contradiction.

$$3(x + 8) + (x + 3) = 4x + 15$$

- A) identity   B) conditional equation   C) contradiction

23. Solve.  $8x + 1 = 2x - 5$

- A) -2   B) -1   C) 0   D) 1

24. Solve.  $4(x - 2) + 6x = 12$

- A)  $\frac{7}{5}$    B)  $\frac{2}{5}$    C) 1   D) 2

25. Solve.  $20 + 10(x - 7) = 5(x + 4) + 5x$

- A)  $\frac{7}{20}$  B)  $\frac{7}{2}$  C)  $-\frac{7}{2}$  D) No solution

26. Solve.  $\frac{x}{x-6} - 4 = \frac{6}{x-6}$

- A) -6 B) 6 C) -4 D) No solution

27. Solve.  $\frac{5}{y+4} + \frac{11}{y^2 + y - 12} = \frac{7}{y-3}$

- A) 16 B) -16 C) 2 D) -2

28. Solve for  $x$  in

$$6 - \frac{4x-2}{2} = \frac{x+8}{8}$$

- A)  $\frac{48}{17}$  B)  $-\frac{15}{32}$  C)  $\frac{32}{15}$  D)  $-\frac{8}{5}$

29. Solve for the indicated variable.

$E = I(R + r)$  for  $r$  (internal resistance)

- A)  $r = \frac{E-R}{I}$  B)  $r = EI - R$  C)  $r = \frac{E}{I} - R$  D)  $r = E - \frac{R}{I}$

30. Solve for the indicated variable.

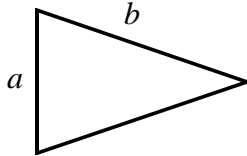
$\frac{1}{f} = (n-1) \left( \frac{1}{R_1} + \frac{1}{R_2} \right)$  for  $R_1$  (modified lens formula)

- A)  $R_1 = \frac{f \cdot (n-1) - R_2}{R_2 \cdot f \cdot (n-1)}$  C)  $R_1 = f \cdot (n-1) - R_2$   
 B)  $R_1 = \frac{R_2 \cdot f \cdot (n-1)}{R_2 - f \cdot (n-1)}$  D)  $R_1 = \frac{R_2 \cdot f \cdot (n-1)}{f \cdot (n-1) + R_2}$

31. Solve for  $x$ .  $y = \frac{x+5}{x-4}$

A)  $x = \frac{9}{y-1}$    B)  $x = \frac{9}{y+1}$    C)  $x = \frac{4y+5}{y-1}$    D)  $x = \frac{4y+5}{y+1}$

32. Write a mathematical expression for the relation described verbally below.  
Side  $b$  is twelve more than side  $a$ .



A)  $b = 12a$    B)  $a = b + 12$    C)  $b = a + 12$    D)  $b + a = 12$

33. Solve for  $x$ :  $\frac{x+1-\frac{30}{x}}{1+\frac{6}{x}} = x-5$

A)  $x = 5$    B)  $x = -6$    C) contradiction   D) identity;  $x \neq -6$  and  $x \neq 0$

34. One employee of a pet store is paid a base salary of \$1700 a month plus a 7% commission on all sales over \$5639 during the month. How much must the employee sell in 1 month to earn a total of \$2600 for the month?

A) \$18,496.14   B) \$5,767.57   C) \$18,727.14   D) \$18,540.36

35. How many gallons of distilled water must be mixed with 75 gallons of 30% alcohol solution to obtain a 25% solution?

A) 15 gallons   B) 25 gallons   C) 30 gallons   D) 5 gallons

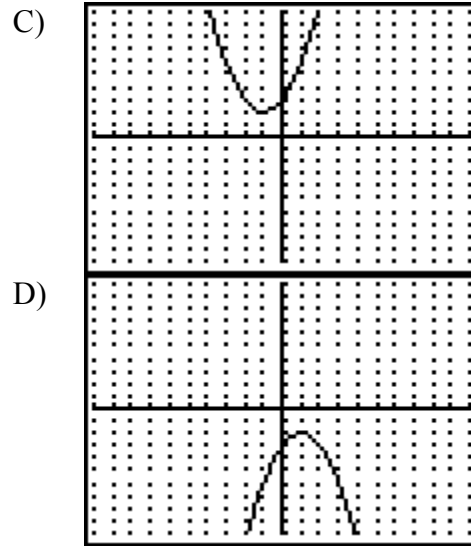
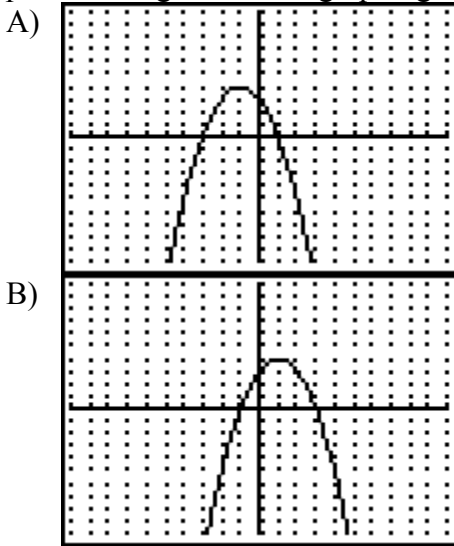
36. A fuel distributor has 162,448 gallons of fuel with 0.9% sulfur content, which exceeds pollution control standards of 0.6% sulfur content. How many gallons of fuel oil with a 0.2% sulfur content must be added to the 162,448 gallons to obtain fuel oil that complies with the pollution control standards? Round to the nearest gallon.

A) 121,836   B) 121,936   C) 121,812   D) 122,169





40. Which of the following is the graph of  $f(x) = -x^2 + 2x + 3$ ? [The graphs below were plotted using a standard graphing window.]



41. Complete the square for the expression.

$$x^2 - 9x$$

- A)  $x^2 - 9x + \frac{81}{4}$     B)  $x^2 - 9x + \frac{81}{2}$     C)  $x^2 - 9x - \frac{9}{2}$     D)  $x^2 - 9x + 81$

42. Complete the square and find the vertex form of the quadratic function.

$$f(x) = 3x^2 + 12x + 11$$

- A)  $f(x) = 3(x + 2)^2 + 11$     C)  $f(x) = 3(x + 6)^2 - 1$   
 B)  $f(x) = 3(x + 2)^2 - 1$     D)  $f(x) = 3(x + 2)^2 + 1$

43. Find the intervals where  $f$  is increasing and where  $f$  is decreasing:  $f(x) = -2x^2 - 7x - 6$

- A)  $f(x)$  is decreasing on  $\left(-\infty, \frac{7}{4}\right)$  and increasing on  $\left(\frac{7}{4}, \infty\right)$   
 B)  $f(x)$  is increasing on  $(-\infty, \infty)$   
 C)  $f(x)$  is increasing on  $\left(-\infty, \frac{7}{2}\right)$  and decreasing on  $\left(\frac{7}{2}, \infty\right)$   
 D)  $f(x)$  is increasing on  $\left(-\infty, -\frac{7}{4}\right)$  and decreasing on  $\left(-\frac{7}{4}, \infty\right)$

44. Find an equation of a quadratic function whose graph satisfies the given conditions.

Vertex:  $(-3, -3)$ ; y-intercept 51

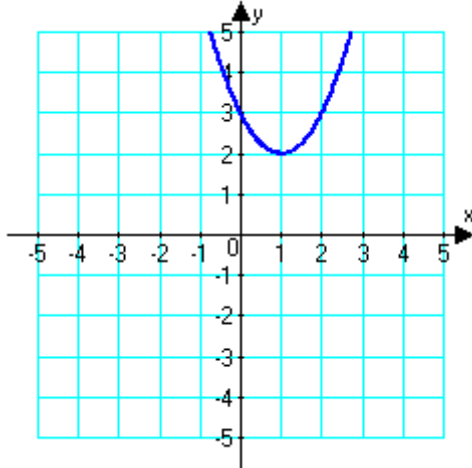
A)  $y = 6x^2 + 36x + 51$

C)  $y = 6x^2 + 18x + 51$

B)  $y = 6x^2 - 36x + 51$

D)  $y = 6x^2 - 36x + 57$

45. Write an equation for the quadratic graphed below.



A)  $x^2 + 2x - 1$

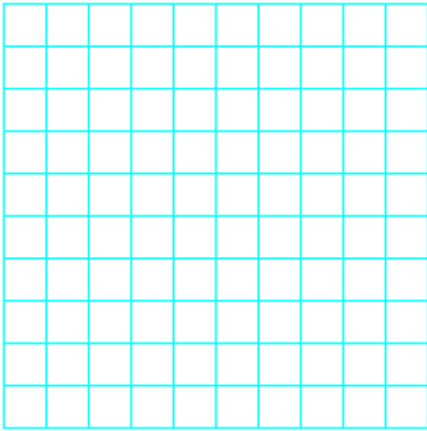
B)  $x^2 + 2x + 3$

C)  $x^2 - 2x + 3$

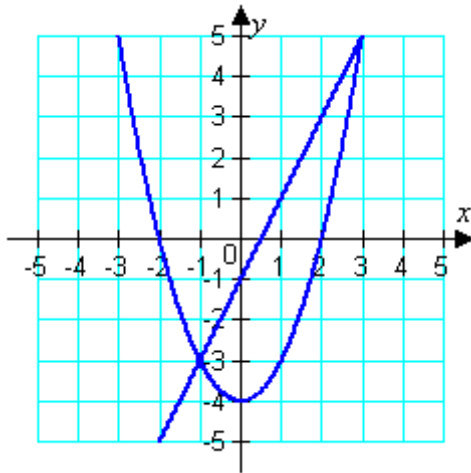
D)  $x^2 - 2x + 1$

46. Find the equation of the secant line through the indicated points on the graph of  $f$ . Graph  $f$  and the secant line on the same coordinate system.

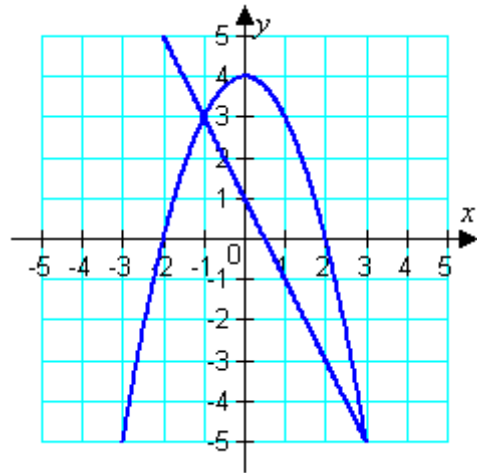
$$f(x) = 4 - x^2; (-1, 3), (3, -5)$$



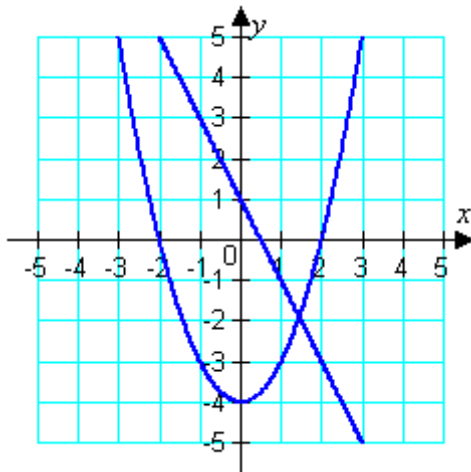
A) Secant line:  $g(x) = 2x - 1$



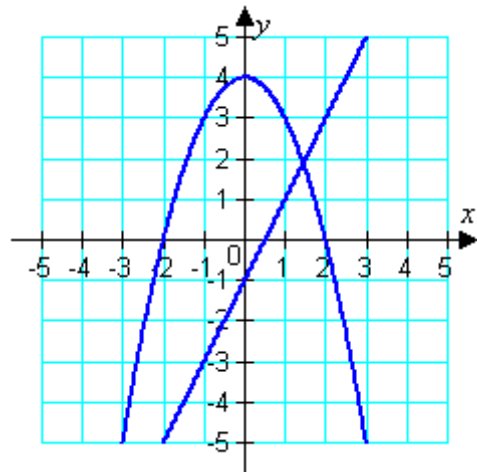
C) Secant line:  $g(x) = -2x + 1$



B) Secant line:  $g(x) = -2x + 1$



D) Secant line:  $g(x) = 2x - 1$



47. A hot air balloon at 10,000 feet drops some candy that bounces off another hot air balloon after 2.5 seconds. What is the height of the lower hot air balloon?  
 A) 9,500 feet B) 9,000 feet C) 9,900 feet D) 9,990 feet
48. Classify the number into one or more of the following types: imaginary, pure imaginary, real, complex.  
 $-8 - 3i$   
 A) real B) real, complex C) imaginary D) imaginary, complex
49. Perform the indicated operation and write the answer in standard form.  
 $(-7i)^2$   
 A) 49 B)  $-49$  C)  $49i^2$  D)  $-49i^2$
50. Subtract. Write the result in standard form.  
 $(-7 - 6i) - (6 - 8i)$   
 A)  $-13 + 2i$  B)  $-13 - 14i$  C)  $-27i$  D)  $-11i$
51. Multiply. Write the result in standard form.  
 $2i(-8 + 6i)$   
 A)  $-10i$  B)  $-28i$  C)  $-12 - 16i$  D)  $12 - 16i$
52. Multiply. Write the result in standard form.  
 $(2 - 4i)(2 + 4i)$   
 A)  $-12 - 16i$  B)  $20 + 16i$  C)  $-12$  D)  $20$
53. Divide and write your answer in standard form.  
 $\frac{11}{4 + 3i}$   
 A)  $\frac{11}{4} + \frac{11}{3}i$  B)  $\frac{44}{25} - \frac{33}{25}i$  C)  $\frac{44}{7} - \frac{3}{7}i$  D)  $\frac{44}{25} - \frac{3}{25}i$
54. Simplify and write the answer in standard form  $\frac{5 + 6i}{2 - 2i}$ .  
 A)  $-\frac{1}{4} + \frac{11}{4}i$  B)  $\frac{1}{4} - \frac{11}{4}i$  C)  $-\frac{2}{61} + \frac{22}{61}i$  D)  $\frac{11}{4} + \frac{11}{4}i$

55. Evaluate and express in standard form:  $\sqrt{7}\sqrt{-63}$   
 A)  $21i$  B)  $63i$  C)  $-21i$  D)  $21$
56. Simplify and put into standard form  $(-25 - \sqrt{-49}) - (-36 - \sqrt{-25})$ .  
 A)  $11 - 2i$  B)  $23i$  C)  $-1 - 2i$  D)  $-1 + 2i$
57. Simplify and put into standard form  $(7 + \sqrt{-13})(4 - \sqrt{-3})$ .  
 A)  $(28 + \sqrt{39}) + (4\sqrt{13} - 7\sqrt{3})i$  C)  $(30 + \sqrt{39}) + (7\sqrt{13} + 6\sqrt{3})i$   
 B)  $(28 + \sqrt{39}) - (4\sqrt{13} - 7\sqrt{3})i$  D)  $(30 - \sqrt{39}) - (6\sqrt{13} - 7\sqrt{3})i$
58. Convert imaginary numbers to standard form, perform the indicated operation, and express the answer in standard form.  

$$\frac{10 - \sqrt{-100}}{10}$$
 A)  $1 + i$  B)  $1 - i$  C)  $1 + 100i$  D)  $1 - 100i$
59. Divide and write your answer in standard form.  

$$\frac{-5 - 2i}{i}$$
 A)  $-2 - 5i$  B)  $2 - 5i$  C)  $-2 + 5i$  D)  $2 + 5i$
60. Simplify and put into standard form  $(3 - 2i)^2 - 3(3 - 2i)$ .  
 A)  $-4 - 6i$  B)  $6 - 4i$  C)  $27 - 8i$  D)  $81 - 10i$
61. Simplify:  $i^{79}$   
 A)  $i$  B)  $-i$  C)  $1$  D)  $-1$
62. Solve for  $x$  and  $y$ .  

$$\frac{(4 + x) + (y + 3)i}{2 - i} = 3 + i$$
 A)  $x = 2, y = -4$  B)  $x = 1, y = -2$  C)  $x = 3, y = -4$  D)  $x = 1, y = -4$

63. Solve. Express your answer in standard form.

$$(3 + i)z + 2i = 6i$$

A)  $\frac{2}{5} - \frac{6}{5}i$    B)  $-\frac{2}{5} - \frac{6}{5}i$    C)  $\frac{2}{5} + \frac{6}{5}i$    D)  $-\frac{2}{5} + \frac{6}{5}i$

64. Solve for
- $z$
- . Express the answer in standard form.

$$-2iz + (-9 + 5i) = (-1 - 2i)z - 6 - 3i$$

A)  $z = -3i$    B)  $z = 3 - 8i$    C)  $z = -9$    D)  $z = 6 + 3i$

65. Simplify and write the answer in standard form
- $(2u + vi)(u - 9vi)$
- .

A)  $2u^2 + 9v^2 - 17uvi$

C)  $4u^2 + 18v^2 - 35uvi$

B)  $-17uv + (2u^2 + 9v^2)i$

D)  $2u^2 + 9v^2 + 17uvi$

66. Solve by factoring.

$$(x + 8)(5x - 2) = 0$$

A)  $8, -\frac{5}{2}$    B)  $-8, \frac{5}{2}$    C)  $8, -\frac{2}{5}$    D)  $-8, \frac{2}{5}$

67. Solve by factoring.

$$x^2 + 6x - 16 = 0$$

A)  $8, 2$    B)  $-8, -2$    C)  $-8, 2$    D)  $8, -2$

68. Solve by factoring
- $x^2 + x = 12$
- .

A)  $4, -3$    B)  $-4, 3$    C)  $1, 0$    D)  $2, 6$

69. Solve by completing the square.

$$x^2 + 6x + 2 = 0$$

A)  $\pm 46$    B)  $\pm\sqrt{46}$    C)  $3 \pm \sqrt{7}$    D)  $-3 \pm \sqrt{7}$

70. Solve using the quadratic formula.

$$x^2 - 6x - 2 = 0$$

A)  $3 \pm \sqrt{7}$    B)  $-3 \pm \sqrt{11}$    C)  $3 \pm \sqrt{11}$    D)  $-3 \pm \sqrt{7}$

71. Use the discriminant to determine the number and type of zeros for

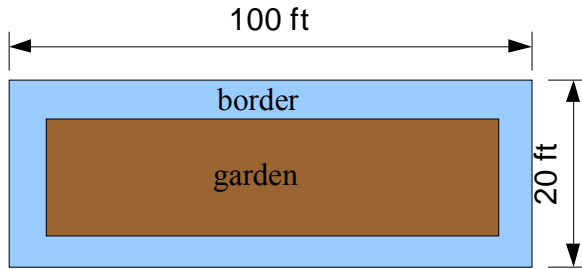
$$0.5x^2 + 2x + 0.75 = 0.$$

A) two distinct real zeros   B) one real zero (a double zero)   C) two imaginary zeros

72. By considering only the discriminant, characterize the zeros of the following quadratic equation:  $2.2x^2 + 1.4x = -4.1$   
 A) two distinct real zeros    B) one real zero (a double root)    C) two imaginary zeros
73. Use a graph to determine the number and types of zeros:  $p^2 - 5.7p + 4.1 = 0$   
 A) two imaginary zeros    C) two real zeros  
 B) one real zero (double root)    D) one real zero and one imaginary zero
74. Determine the roots of  $x^2 - 32x + 452 = 0$ .  
 A)  $x = 16, x = -14$     B)  $x = 16i, x = -14i$     C)  $x = 16 \pm 14i$     D)  $x = -14 \pm 16i$
75. Solve for  $b$ :  $f = k(Z - b)^2$   
 A)  $b = Z \pm \sqrt{\frac{f}{k}}$     B)  $b = Z - \left(\frac{f}{k}\right)^2$     C)  $b = Z - \sqrt{fk}$     D)  $b = \pm \sqrt{Z - \frac{f}{k}}$
76. When the following quadratic is solved  $x^2 + \sqrt{5}x - 7 = 0$  and the roots approximated to two decimal places, the result is:  
 A)  $x = -3.99$  and  $x = 1.75$     C)  $x = 2.24$  and  $x = 1.75$   
 B)  $x = -4.00$  and  $x = -1.75$     D)  $x = 2.24$  and  $x = 4.76$
77. When the following equation is solved  $\frac{1}{x+3} - \frac{1}{x-3} = 3$  and the roots approximated to two decimal places, the result is:  
 A)  $x = \pm 2.65$     B)  $x = \pm 1.73$     C)  $x = \pm 1.27$     D)  $x = 1.73$  and  $x = 1.27$
78. Solve and express the solution in standard form:  $x^2 + 15ix - 54 = 0$   
 A)  $x = \pm 6i, x = \pm 9i$     B)  $x = -6i, x = -9$     C)  $x = -6i, x = -9i$     D)  $x = -9i, x = -9$
79. Find all solutions.  
 $x^4 - 1 = 0$   
 A)  $\pm 1$     B)  $\pm 1, \pm i$     C)  $1, i$     D)  $1$
80. Are there two consecutive odd numbers such that the difference in their squares is 80?  
 A) Yes    B) No



81. A gardener has a garden that is 20 feet wide and 100 feet long. She wants to have a stone border (along all 4 edges of the garden and inside of the garden) of uniform width. The stone border should use 100 square feet of crushed stone. How wide should the border be in inches?



- A) 5.0 inches    B) 11.2 inches    C) 9 inches    D) 9.5 inches
82. The following data relates the weight of trees (in kilograms) and their circumferences (in meters):

weight	circumference
8.4	0.188
23.5	0.314
94.2	0.628
135.7	0.753
159.2	0.816

Using a quadratic fit, estimate the circumference of a tree weighing 75 kilograms to three decimal places.

- A) 0.555 meters    B) 0.501 meters    C) 0.471 meters    D) 0.223 meters
83. Is the following a valid statement?  
 $(x + 7)^2 = x^2 + 49$   
 A) Valid    B) Not valid
84. How many of the following the equations are of quadratic type:
- $2x^{-6} + x^{-12} = 4$
  - $x^{-7} = x^{-3} + 1$
  - $x^{12} + 8x^3 = 3$
  - $x^{12} - 7x^6 = 2$
  - $x^{1/2} - 7x = 45$
- A) all of them    B) none of them    C) two of them    D) three of them

85. How many of the following equations can be transformed into an equation of quadratic type by making a substitution of the form  $u = x^n$  ?

- $2x^{-4} + x^{-2} + 8 = 0$
- $x^5 + 5x^2\sqrt{x} - 12 = 0$
- $5x^6 - 2x^2 + 3 = 0$
- $\frac{1}{x^4} + \frac{1}{x^2} = 2$

A) all of them   B) none of them   C) 2 of them   D) 3 of them

86. Solve.  $\sqrt{4x+12} = 8$

A) 13   B) -4   C) -10   D) No solution

87. Solve algebraically:  $5x^{-2/3} - 7x^{-1/3} + 1 = 0$

A)  $x = \frac{\pm(\sqrt{29} - 7)^{1/3}}{8}$

C)  $x = \pm(\sqrt{29} - 7)^3$

B)  $x = \frac{\pm(\sqrt{29} + 7)^3}{4}$

D)  $x = \frac{(7 \pm \sqrt{29})^3}{8}$

88. Solve.  $10x^{-2} + 2x^{-1} + 1 = 0$

A)  $-1 \pm \sqrt{11}$    B)  $1 \pm \sqrt{11}$    C)  $-1 \pm 3i$    D)  $1 \pm 3i$

89. Solve for  $x$ :  $x = \sqrt{50x^2 + 64}$

A)  $\pm \frac{8}{7}i$    B)  $\frac{8}{7}i$    C)  $\pm \frac{8}{7}$    D) 0

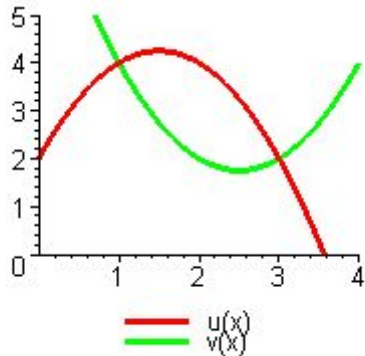
90. Solve.  $\sqrt{5x+1} - 1 = 3x$

A)  $0, -\frac{1}{9}$    B)  $0, \frac{1}{9}$    C) 0   D) No solution

91. If the splash of a stone dropped into a well is heard 3.75 seconds after the stone is released, how far below ground is the water level (to the nearest foot)? (Assume the sound travels infinitely fast).

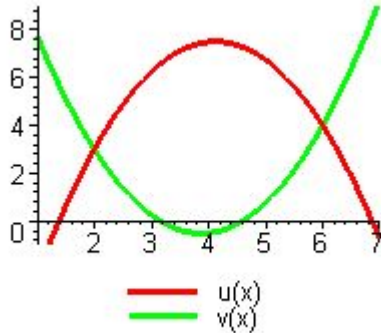
A) 227 feet   B) 226 feet   C) 113 feet   D) 225 feet

92. Use the graphs of  $y = u(x)$  and  $y = v(x)$  shown below to determine the values of  $x$  which best correspond to  $u(x) \geq v(x)$ . (Assume that the graphs continue with the same slopes as indicated beyond the portions shown here.)



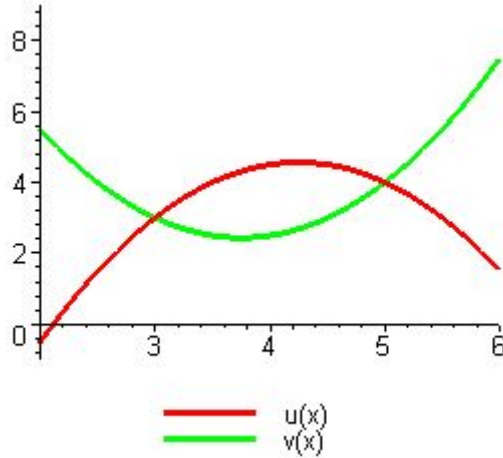
- A)  $[1, 3]$    B)  $(-\infty, -1]$  and  $[3, \infty)$    C)  $(-\infty, -1)$  and  $(3, \infty)$    D)  $(1, 3)$    E)  $[1, \infty)$

93. Use the graphs of  $y = u(x)$  and  $y = v(x)$  shown below to determine the values of  $x$  which best correspond to  $u(x) - v(x) < 0$ . (Assume that the graphs continue with the same slopes as indicated beyond the portions shown here.)



- A)  $[2, 6]$    B)  $(-\infty, 2]$  and  $[6, \infty)$    C)  $(-\infty, 2)$  and  $(6, \infty)$    D)  $(2, 6)$

94. Use the graphs of  $y = u(x)$  and  $y = v(x)$  shown below to solve the inequality  $u(x) < v(x)$ . (Assume that the graphs continue with the same slopes as indicated beyond the portions shown here.)



- A)  $[3, 5]$  B)  $(3, 5)$  C)  $(-\infty, 3]$  and  $[5, \infty)$  D)  $(-\infty, 3)$  and  $(5, \infty)$

95. Write as an absolute value inequality.

$x$  is more than 3 units from 9.

- A)  $|x - 9| > 3$  B)  $|x - 9| \geq 3$  C)  $|x + 9| > 3$  D)  $|x + 9| \geq 3$

96. Write the inequality as a verbal statement about distance.

$$|x| > 2$$

- A)  $x$  is more than 2 units away from the origin.  
 B)  $x$  is at least 2 units away from the origin.  
 C)  $x$  is less than 2 units away from the origin.  
 D)  $x$  is no more than 2 units away from the origin.

97. Solve.

$$2x + 7 < 7x - 4$$

- A)  $x < -\frac{11}{5}$  B)  $x < \frac{11}{5}$  C)  $x > \frac{11}{5}$  D)  $x > -\frac{11}{5}$

98. Solve.

$$(x - 8)(x - 6) \leq 0$$

- A)  $-8 \leq x \leq -6$  B)  $x \leq -8$  or  $x \geq -6$  C)  $6 \leq x \leq 8$  D)  $x \leq 6$  or  $x \geq 8$

99. Solve. Write the solution in interval notation.

$$|x - 5| \leq 4$$

- A)  $(-\infty, 1) \cup (9, \infty)$  B)  $(-\infty, 1] \cup [9, \infty)$  C)  $(1, 9)$  D)  $[1, 9]$

100. Solve. Write the solution in interval notation.

$$|x + 6| \geq 9$$

- A)  $(-\infty, -15) \cup (3, \infty)$  B)  $(-\infty, -15] \cup [3, \infty)$  C)  $(-15, 3)$  D)  $[-15, 3]$

101. Solve the inequality  $\frac{x}{4} > -3$ .

- A)  $x > -12$  B)  $x < 12$  C)  $x < 3$  D)  $x > -3$

102. Solve the inequality  $\frac{x}{4} + 8 < 5$ .

- A)  $x < -12$  B)  $x < -32$  C)  $x < 8$  D)  $x > -32$

103. Solve the inequality  $\frac{x}{5} + 4 \geq 9$ .

- A)  $x \geq 25$  B)  $x < 5$  C)  $x > 5$  D)  $x \leq 25$

104. Solve the inequality  $|9x + 3| \leq 7$ .

- A)  $-\frac{10}{9} \leq x \leq \frac{4}{9}$  B)  $x \leq \frac{4}{9}$  C)  $x \geq -\frac{10}{9}$  D)  $x \leq -\frac{10}{9}$  or  $x \geq \frac{4}{9}$

105. Solve the inequality  $|2x + 1| \leq 3$ .

- A)  $-2 \leq x \leq 1$  B)  $x < -2$  C)  $x > 1$  D)  $x \geq -1$  and  $x \leq -2$

106. Solve and write your answer in interval notation.

$$0 < |x - 5| < 0.01$$

- A)  $(-\infty, 4.99] \cup [5.01, \infty)$  C)  $[4.99, 5.01]$   
 B)  $(-\infty, 4.99) \cup (5.01, \infty)$  D)  $(4.99, 5.01)$

107. Find the interval(s) where the function is positive.

$$f(x) = x^2 + 7x + 10$$

- A)  $(-\infty, 2) \cup (5, \infty)$  B)  $(-\infty, -5) \cup (-2, \infty)$  C)  $(-5, -2)$  D)  $(2, 5)$

108. A textbook publisher plans to market a new algebra textbook. The fixed costs associated with the text's publication are \$320,000, and the variable costs are \$40 per textbook. The text will be sold to retailers for \$100. How many texts must be sold for the publisher to show a profit? Round to the nearest whole number.
- A) 2286 or more texts                      C) 19,200,000 or more texts  
B) 5333 or more texts                      D) 1692 or more texts

**Answer Key**

- |       |       |        |
|-------|-------|--------|
| 1. C  | 45. C | 89. B  |
| 2. A  | 46. C | 90. A  |
| 3. B  | 47. C | 91. D  |
| 4. C  | 48. D | 92. A  |
| 5. D  | 49. B | 93. C  |
| 6. B  | 50. A | 94. D  |
| 7. D  | 51. C | 95. A  |
| 8. A  | 52. D | 96. A  |
| 9. A  | 53. B | 97. C  |
| 10. D | 54. A | 98. C  |
| 11. A | 55. A | 99. D  |
| 12. B | 56. A | 100. B |
| 13. C | 57. A | 101. A |
| 14. C | 58. B | 102. A |
| 15. C | 59. C | 103. A |
| 16. B | 60. A | 104. A |
| 17. A | 61. B | 105. A |
| 18. B | 62. C | 106. D |
| 19. B | 63. C | 107. B |
| 20. A | 64. B | 108. B |
| 21. B | 65. A |        |
| 22. C | 66. D |        |
| 23. B | 67. C |        |
| 24. D | 68. B |        |
| 25. D | 69. D |        |
| 26. D | 70. C |        |
| 27. B | 71. A |        |
| 28. A | 72. A |        |
| 29. C | 73. C |        |
| 30. B | 74. C |        |
| 31. C | 75. A |        |
| 32. C | 76. A |        |
| 33. D | 77. A |        |
| 34. A | 78. C |        |
| 35. A | 79. B |        |
| 36. A | 80. A |        |
| 37. A | 81. A |        |
| 38. D | 82. A |        |
| 39. B | 83. B |        |
| 40. B | 84. D |        |
| 41. A | 85. D |        |
| 42. B | 86. A |        |
| 43. D | 87. D |        |
| 44. A | 88. C |        |