TEST NAME: **A-REI.4 Schoolnet**
TEST ID: **1582947**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **School Assessment**

Student: _____

Class: _____

Date: _____

1. **What are the solutions to the equation $3x^2 - 45x = 0$?**

   A. $x = -15$ and $x = 0$
   B. $x = 0$ and $x = 15$
   C. $x = 0$ and $x = 45$
   D. $x = -45$ and $x = 0$

2. **Which function is related to the quadratic equation that has –6 as its only solution?**

   A. $f(x) = x^2 + 12x + 36$
   B. $f(x) = x^2 - 12x + 36$
   C. $f(x) = x^2 - 36$
   D. $f(x) = x^2 + 6$

3. **What are the solutions to the equation $2x^2 + 3x - 4 = 0$?**

   A. $x = \frac{3 \pm \sqrt{41}}{4}$
   B. $x = \frac{-3 \pm \sqrt{41}}{2}$
   C. $x = \frac{3 \pm \sqrt{23}}{4}$
   D. $x = \frac{-3 \pm \sqrt{23}}{2}$

4. **Which value of x is a solution to $x^2 + 8x - 16 = 0$?**

   A. $x = -8$
   B. $x = -4$
   C. $x = 4$
   D. $x = 8$

5. What are the solutions to the equation below?

$2x^2 - 3x - 12 = 0$

A. $\frac{-3 \pm \sqrt{87}}{4}$

B. $\frac{3 \pm \sqrt{87}}{2}$

C. $\frac{-3 \pm \sqrt{105}}{2}$

D. $\frac{3 \pm \sqrt{105}}{4}$

6. **Which is one root of the equation $y^2 - 6y - 3 = 0$?**

A. $3 - \sqrt{6}$

B. $3 - 2\sqrt{3}$

C. $3 - 4\sqrt{3}$

D. $3 - 2\sqrt{6}$

7. **An equation in the form $ax^2 + bx + c = 0$ is solved by the quadratic formula. The solution to the equation is shown below.**

$x = \frac{-5 \pm \sqrt{13}}{2}$

What are the values of *a*, *b* and *c* in the quadratic equation?

A. $a = 1, b = 5, c = 3$

B. $a = 1, b = -5, c = 3$

C. $a = 2, b = -5, c = 3$

D. $a = 2, b = 5, c = 3$

8. **Which quadratic equation has $\frac{-3 \pm \sqrt{17}}{2}$ as its root?**

A. $x^2 + 3x + 2 = 0$

B. $x^2 - 3x - 2 = 0$

C. $x^2 + 3x - 2 = 0$

D. $x^2 - 3x + 2 = 0$

9. **For what values of *t* does** $(6+t)(1-t)=10$**?**

A. -9 and 4

B. -6 and 1

C. -4 and -1

D. 2 and 3

10. **What are the solutions to** $x^2-6x+10=0$**?**

A. $x=2$ and $x=4$

B. $x=-10$ and $x=-4$

C. $x=3+i$ and $x=3-i$

D. $x=-3+i$ and $x=-3-i$

11. **Use the quadratic formula to solve** $2r^2+3=-7r$.

A. $r=-\frac{7}{4}+\frac{\sqrt{73}}{4}$ and $\frac{7}{4}-\frac{\sqrt{73}}{4}$

B. $r=-3$ and $-\frac{1}{2}$

C. $r=\frac{7}{4}+\frac{\sqrt{73}}{4}$ and $\frac{7}{4}-\frac{\sqrt{73}}{4}$

D. $r=3$ and $\frac{1}{2}$

12. **Solve** $2x^2-5x-3=0$ **for *x*.**

A. $x=-\frac{1}{2}$ or $x=-3$

B. $x=-\frac{1}{2}$ or $x=3$

C. $x=\frac{1}{2}$ or $x=-3$

D. $x=\frac{1}{2}$ or $x=3$

13. **What are the solutions to the equation** $ax^2-11x+c=0$**?**

A. $x=\frac{11\pm\sqrt{121-4ac}}{2a}$

B. $x=\frac{11\pm\sqrt{-121-4ac}}{2a}$

C. $x=\frac{-11\pm\sqrt{121-4ac}}{2a}$

D. $x=\frac{-11\pm\sqrt{-121-4ac}}{2a}$

14. **What is the first step in the solution of $3x^2 + 6x = 12$ by completing the square?**

A. $x^2 + x = 2$
B. $x^2 + 2x = 4$
C. $3x^2 + 6x + 9 = 12 + 9$
D. $3x^2 + 6x + 36 = 12 + 36$

15. **What are the solutions to $0 = x^2 - 18x + 32$?**

A. $x = -3$ and $x = 6$
B. $x = -2$ and $x = 9$
C. $x = 2$ and $x = 16$
D. $x = 4$ and $x = 8$

16. **Kinetic energy is produced when an object is moving. The kinetic energy of an object can be modeled by the equation $K = \frac{5}{4}v^2$, where *K* represents the kinetic energy in joules and *v* represents the velocity of the object in meters per second. If the kinetic energy of an object is 125 joules, what is the velocity of the object in meters per second?**

A. 5
B. 10
C. 50
D. 100

17. **Which of the following quadratic functions has roots $x = 3$ and $x = -1$?**

A. $x^2 - 2x - 3$
B. $x^2 - 4x + 3$
C. $x^2 + 2x - 3$
D. $x^2 + 4x + 3$

18. **The first two steps in the solution of $2x^2 - 10x = 5$ by completing the square are shown below.**

Step 1: $x^2 - 5x = \frac{5}{2}$
Step 2: $x^2 - 5x + \frac{25}{4} = \frac{5}{2} + \frac{25}{4}$
Step 3: ?

Which equation is Step 3 in the solution?

A. $\left(x - \frac{5}{4}\right) = \frac{35}{4}$
B. $\left(x - \frac{5}{2}\right) = \frac{35}{4}$
C. $\left(x - \frac{5}{4}\right)^2 = \frac{35}{4}$
D. $\left(x - \frac{5}{2}\right)^2 = \frac{35}{4}$

19. **What are the solutions to the equation $-2t^2 + 10t = 0$?**

A. $t = -5$ and $t = 0$
B. $t = -2$ and $t = -5$
C. $t = 2$ and $t = 5$
D. $t = 0$ and $t = 5$

20. **What is the solution set for the equation $x^2 - 9 = 0$?**

A. $\{3\}$
B. $\{9\}$
C. $\{-3, 3\}$
D. $\{-9, 9\}$

21. **Which value of $x > 0$ is a solution to $(x - 12)(x + 8) = 0$?**

A. $x = -12$
B. $x = -8$
C. $x = 8$
D. $x = 12$

22. **What value should be substituted for *n* in the quadratic formula below to solve $x^2 - 7x + 3 = 0$?**

$$x = \frac{7 \pm \sqrt{n}}{2}$$

A. 2
B. 26
C. 37
D. 61

23. **What is the solution set for the equation $3x^2 - 4x - 2 = 0$?**

A. $\left\{\frac{-2 + \sqrt{10}}{3}, \frac{-2 - \sqrt{10}}{3}\right\}$
B. $\left\{\frac{2 + \sqrt{10}}{3}, \frac{2 - \sqrt{10}}{3}\right\}$
C. $\{-2 + \sqrt{10}, -2 - \sqrt{10}\}$
D. $\{2 + \sqrt{10}, 2 - \sqrt{10}\}$

24. **What is the solution set for the equation $x^2 - 3x = 10$?**

A. $\{-13, 10\}$
B. $\{-5, 2\}$
C. $\{-2, 5\}$
D. $\{10, 13\}$

25. **To find the roots of the quadratic equation $2x^2 - 4x + 3 = 0$, Carla correctly applied the quadratic formula. Which of the following is that correct application?**

A. $x = \frac{-4 \pm \sqrt{(-4)^2 - 4(2)(3)}}{2(2)}$

B. $x = \frac{-4 \pm \sqrt{(-4)^2 - 4(-4)(3)}}{2(2)}$

C. $x = \frac{-(-4) \pm \sqrt{(4)^2 - 4(2)(3)}}{2(2)}$

D. $x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(2)(3)}}{2(2)}$

26. **Marcus is solving $2x^2 - x - 3 = 0$ by completing the square. His work is shown.**

Step 1: $2x^2 - x = 3$

Step 2: $x^2 - \frac{1}{2}x = \frac{3}{2}$

Which equation should be Step 3 in this solution?

A. $x^2 - \frac{1}{2}x - \frac{1}{4} = \frac{3}{2} - \frac{1}{4}$

B. $x^2 - \frac{1}{2}x - \frac{1}{16} = \frac{3}{2} - \frac{1}{16}$

C. $x^2 - \frac{1}{2}x + \frac{1}{4} = \frac{3}{2} + \frac{1}{4}$

D. $x^2 - \frac{1}{2}x + \frac{1}{16} = \frac{3}{2} + \frac{1}{16}$

27. **What are the solutions to the equation $x^2 - 7x - 30 = 0$?**

A. $x = -3$ or $x = -10$

B. $x = -3$ or $x = 10$

C. $x = 3$ or $x = -10$

D. $x = 3$ or $x = 10$

28. **What are the solutions to the equation $(x + 3)(x - 1) = 5$?**

A. $x = 2$ or $x = 6$

B. $x = -4$ or $x = 2$

C. $x = 8$ or $x = 4$

D. $x = -3$ or $x = 1$

29. **What are the solutions for *x* in the equation $x^2 - 102x + 200 = 0$?**

A. 2 or 100

B. 4 or 50

C. 8 or 25

D. 10 or 20

30. **Jonah threw a tennis ball straight up in the air. The ball traveled up to a maximum height, then fell back down to Earth. The height of the ball at various times after being thrown is shown in the table below.**

Height of Jonah's Tennis Ball

Time (seconds)	Height (feet)
1	40
2	42
3	12

The height of the ball as a function of time is described by the function $h = -16t^2 + 50t + 6$. **At which of the following times was the ball located exactly at a height of 41 feet?**

A. 1.35 seconds
B. 1.50 seconds
C. 1.95 seconds
D. 2.07 seconds

31. **The formula gives the acceleration (*a*) of an object moving in a circular path at a constant speed. Let *r* represent the length of the radius of the circular path, and let *v* represent the constant speed of the object.**

$$a = \frac{v^2}{r}$$

Sandra is riding a bicycle on a circular training track with radius of 32 meters. If her acceleration is $8_{\text{meters/second}^2}$, **at what speed in meters/second is she traveling?**

A. 4
B. 16
C. 128
D. 256

32. **What are the roots of the equation** $x^2 + 9x - 2 = 0$?

A. $\frac{-9 \pm \sqrt{73}}{2}$
B. $\frac{-9 \pm \sqrt{89}}{2}$
C. $\frac{-9 \pm \sqrt{17}}{2}$
D. $\frac{9 \pm \sqrt{17}}{2}$

33. **What are the solutions of the equation $2x^2 + 3x - 4 = 0$?**

A. $\frac{-3 \pm \sqrt{41}}{4}$

B. $\frac{-3 \pm \sqrt{41}}{2}$

C. $\frac{3 \pm \sqrt{41}}{4}$

D. $\frac{3 \pm \sqrt{41}}{2}$

34. **The function $S = m^2 + 6m + 8$ models the growth of book sales in *m* months, where *S* is an amount in thousands of dollars. In how many months do book sales reach 80 thousand dollars?**

A. 6 months

B. 8 months

C. 9 months

D. 12 months

35. **Solve $6x^2 - 2x - 1 = 0$. The answer must be in simplest form.**

A. $\frac{-1 \pm 2\sqrt{7}}{6}$

B. $\frac{1 \pm 2\sqrt{7}}{6}$

C. $\frac{-1 \pm \sqrt{7}}{6}$

D. $\frac{1 \pm \sqrt{7}}{6}$

36. **What are the solutions of the equation $x^2 + 6x + 1 = 0$?**

A. $x = -3 + 2\sqrt{2}$ or $x = -3 - 2\sqrt{2}$

B. $x = 3 + 2\sqrt{2}$ or $x = 3 - 2\sqrt{2}$

C. $x = -3 + \sqrt{10}$ or $x = -3 - \sqrt{10}$

D. $x = 3 + \sqrt{10}$ or $x = 3 - \sqrt{10}$

37. **What is the next step in the solution to this quadratic equation?**

$$2x^2 - 6x - 8 = 0$$
$$a = 2,\ b = -6,\ c = -8$$

A. $x = \dfrac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(-8)}}{2(2)}$

B. $x = \dfrac{-(-6) \pm \sqrt{(-6)^2 + 4(2)(-8)}}{2(2)}$

C. $x = \dfrac{-6 \pm \sqrt{-6^2 - 4(2)(-8)}}{2(2)}$

D. $x = \dfrac{+6 \pm \sqrt{6^2 - 4(2)(8)}}{2(2)}$

38. **What are the roots of** $-\frac{1}{2}x^2 + 4 = 2x$ **?**

A. $-2 - 2\sqrt{3}$ and $-2 + 2\sqrt{3}$

B. $2 - 2\sqrt{3}$ and $2 + 2\sqrt{3}$

C. $-4 - 4\sqrt{3}$ and $-4 + 4\sqrt{3}$

D. $4 - 4\sqrt{3}$ and $4 + 4\sqrt{3}$

39. **Which of the following numbers is one root of the equation** $x^2 - 4x + 2 = 0$ **?**

A. $2 - \sqrt{6}$

B. $2 - \sqrt{2}$

C. $2 - 2\sqrt{2}$

D. $2 - 2\sqrt{6}$

40. What are the solutions to the equation below?

$4x^2 + 9 = 25$

A. $-1, 1$

B. $-2, 2$

C. $-4, 4$

D. $-8, 8$

41. **Using factoring, which value of *x* is a possible solution to the equation $3x^2 + 15x = 0$?**

A. $x = -15$
B. $x = -5$
C. $x = -3$
D. $x = 5$

42. **What are the solutions to $4x^2 + 3600 = 0$?**

A. ± 15
B. ± 30
C. $\pm 15i$
D. $\pm 30i$

43. **Which equation can be used to solve $x^2 - 4x - 12 = 0$ by factoring?**

A. $(x - 6)(x - 2) = 0$
B. $(x - 6)(x + 2) = 0$
C. $(x + 6)(x - 2) = 0$
D. $(x + 6)(x + 2) = 0$

44. **Elise solved the quadratic equation $2x^2 + 9x + 4 = 0$ by completing the square. The first two steps of her solution are shown.**

Step 1: $x^2 + \frac{9x}{2} + 2 = 0$
Step 2: $x^2 + \frac{9x}{2} = -2$
Step 3: _____

What should be Step 3 in solving the equation by completing the square?

A. $x^2 + \frac{9x}{2} + \frac{9}{4} = -2 + \frac{9}{4}$
B. $x^2 + \frac{9x}{2} + \frac{81}{16} = -2 + \frac{81}{16}$
C. $x^2 + \frac{9x}{2} - \frac{9}{4} = -2 - \frac{9}{4}$
D. $x^2 + \frac{9x}{2} - \frac{81}{16} = -2 - \frac{81}{16}$

45. **If (3, 2) is a solution to $y = x^2 + w$, then *w* =**

A. -7
B. -1
C. 7
D. 11

46. **Which of the following numbers represents the solution to the quadratic equation $x^2 + 12x - 27 = 0$?**

A. $-6 \pm 6\sqrt{7}$

B. $-12 \pm 6\sqrt{7}$

C. $-6 \pm 3\sqrt{7}$

D. $-12 \pm 3\sqrt{7}$

47. **What are the roots of $\frac{1}{2}x^2 = x + 3$?**

A. $1 \pm \sqrt{-5}$

B. $-1 \pm \sqrt{7}$

C. $1 \pm \sqrt{7}$

D. $2 \pm 2\sqrt{7}$

48. **What are the solutions to $(x - 2)(x - 4) = -1.04$?**

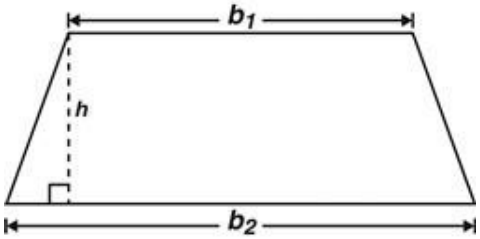
A. $3 + 0.2i$ and $3 - 0.2i$

B. $6 + 0.2i$ and $6 - 0.2i$

C. 0.96 and 2.96

D. 2 and 4

49. **The area of the trapezoid below can be found by the formula $A = \frac{1}{2}h(b_1 + b_2)$.**



The area of this trapezoid is 30 square inches. If $b_1 = h$ and $b_2 = h + 7$, what is the length of *h* in inches?

A. 4

B. 11

C. 15

D. 26.5

50. **Curtis solves the quadratic equation $x^2 + 10x + 24 = 0$ by completing the square. His work is shown below.**

Step 1: $x^2 + 10x = -24$
Step 2: $x^2 + 10x + 25 = -24 + 25$
Step 3: $(x + 5)^2 = 1$
Step 4: ?

Which of the following equations should represent Step 4?

A. $x + 5 = 0$
B. $\sqrt{(x + 5)^2} = \pm\sqrt{1}$
C. $(x + 5)^2 - 1 = 0$
D. $\sqrt{(x + 5)^2 - 1} = \sqrt{0}$

51. **What is the solution set for the following equation?**

$x^2 - 8x = 9$

A. $\{-9, 1\}$
B. $\{-1, 9\}$
C. $\{1, 9\}$
D. $\{9, 17\}$

52. **Solve $-\frac{1}{2}x^2 + 4 = 2x$. The answer must be in simplest form.**

A. $-2 \pm 2\sqrt{3}$
B. $2 \pm 2\sqrt{3}$
C. $-4 \pm 4\sqrt{3}$
D. $4 \pm 4\sqrt{3}$

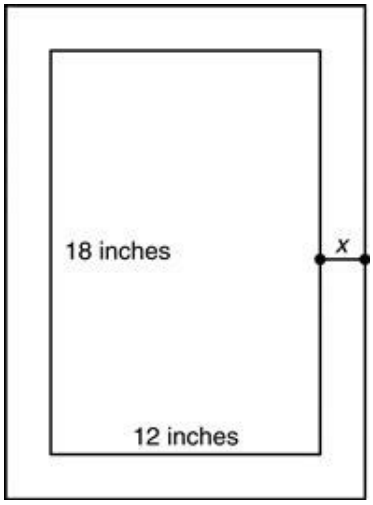
53. **Which set contains the solutions to the equation $x^2 + x - 12 = 0$?**

A. $\{-6, 2\}$
B. $\{-4, 3\}$
C. $\{-3, 4\}$
D. $\{-2, 6\}$

54. **What are the solutions to the equation $x^2 - 10x + 16 = 0$?**

A. $x = 8$ or $x = -2$
B. $x = -4$ or $x = 4$
C. $x = -16$ or $x = -1$
D. $x = 2$ or $x = 8$

55. **A frame *x* inches wide is shown around a 12-inch by 18-inch rectangular picture. The area of the framed picture can be represented by the expression** $(2x + 12)(2x + 18)$.



What is the width of the frame if the area of the framed picture is 391 square inches?

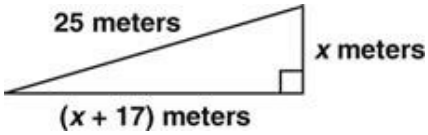
A. $2\frac{1}{2}$ inches

B. $3\frac{1}{2}$ inches

C. $12\frac{1}{2}$ inches

D. $17\frac{1}{2}$ inches

56. **What is the length, in meters, of the shortest side of the right triangle below?**



A. 4

B. 7

C. 17

D. 24

57. **Using factoring, what are the solutions to the equation** $x^2 + 9x + 8 = 0$?

A. $x = -2$ or $x = -4$

B. $x = -1$ or $x = -8$

C. $x = 1$ or $x = 8$

D. $x = 2$ or $x = 4$

58. **Which of the following quadratic functions has roots** $-1 + \sqrt{5}$ **and** $-1 - \sqrt{5}$?

A. $x^2 - 2x - 4$

B. $x^2 + 2x + 1$

C. $x^2 + 2x - 4$

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

59. **Use the quadratic formula to solve** $y^2 + 9y = 8$.

A. $y = -\frac{9}{2} \pm \frac{\sqrt{113}}{2}$

B. $y = -9 \pm \frac{\sqrt{113}}{2}$

C. $y = -8 \text{or} -1$

D. $y = -12\frac{1}{2} ?? \text{or} ?? -5\frac{1}{2}$

60. **What value should be substituted for *n* in the quadratic formula below to solve** $x^2 - 5x + 2 = 0$?

$$x = \frac{5 \pm \sqrt{n}}{2}$$

A. 2

B. 17

C. 18

D. 33

61. **Which gives the solutions of the quadratic equation** $ax^2 + bx + c = 0$?

A. $x = \frac{b \pm \sqrt{b^2 - 4ac}}{2}$

B. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2}$

C. $x = \frac{b \pm \sqrt{b^2 - 4ac}}{2a}$

D. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

62. **An equation in the form** $ax^2 + bx + c = 0$ **is solved by the quadratic formula. The solution to the equation is shown.**

$$x = \frac{-3 \pm \sqrt{17}}{2}$$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1,\ b = 3,\ c = -2$

B. $a = 1,\ b = -3,\ c = -2$

C. $a = 1,\ b = -3,\ c = -1$

D. $a = 1,\ b = 3,\ c = -1$

63. **What is the solution set for** $(x + 1)^2 - 4 = 0$?

A. $\{-5,\ 3\}$

B. $\{-3,\ 1\}$

C. $\{-3,\ 5\}$

D. $\{-1,\ 3\}$

64. **For which values of *x* is this equation true?**

$(x-y)^2 = z$

A. $\{y \pm z\}$
B. $\{y \pm \sqrt{z}\}$
C. $\{-y \pm z\}$
D. $\{-y \pm \sqrt{z}\}$

65. What is the solution set to the quadratic equation shown below?

$\left(x - \frac{7}{4}\right)^2 = -\frac{1}{4}$

A. $x = \frac{\sqrt{7}}{2} \pm \frac{1}{2}i$

B. $x = \frac{7}{4} + \frac{1}{2}i$

C. $x = \frac{7}{4} \pm \frac{1}{2}i$

D. $x = \frac{7}{4} \pm \frac{1}{2}$

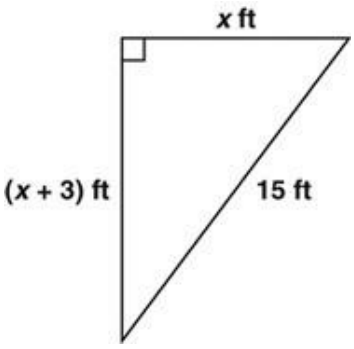
66. **The function $h(t) = -16t^2 + 75t + 80$ models the height in feet, *h*, of a ball as it is thrown into the air at time, *t*, in seconds. At which of the following times will the ball be 124 feet above the ground?**

A. 3 seconds
B. 4 seconds
C. 5 seconds
D. 10 seconds

67. **Solve $x^2 - x - 3 = 0$. The answer must be in simplest form.**

A. $-1 \pm \sqrt{13}$
B. $1 \pm \sqrt{13}$
C. $\frac{-1 \pm \sqrt{13}}{2}$
D. $\frac{1 \pm \sqrt{13}}{2}$

68. **A right triangle is shown below.**



The relationship between the 3 sides of the triangle is represented by the equation $x^2 + (x+3)^2 = 225$. What is the length, in feet, of the shortest side?

A. 2
B. 6
C. 9
D. 12

69. **What are the solutions to the equation $6x^2 + 13x + 6 = 0$?**

A. $x = -\frac{2}{3}$ or $x = -\frac{3}{2}$
B. $x = -\frac{1}{3}$ or $x = -3$
C. $x = -\frac{1}{2}$ or $x = -2$
D. $x = -\frac{1}{6}$ or $x = -6$

70. **What are the solutions to $3(x-9)^2 = -180$?**

A. $-9 \pm 2i\sqrt{15}$
B. $-9 \pm 4i\sqrt{15}$
C. $9 \pm 2i\sqrt{15}$
D. $9 \pm 4i\sqrt{15}$

71. What are the solutions to the equation below?

$8b^2 - 7 = 193$

A. $b = \pm 5$
B. $b = \pm 12.5$
C. $b = \pm 25$
D. $b = \pm 625$

72. **Which values of *x* in the equation are true?**

$(x-4)^2 = 10$

A. $\{-10 \pm \sqrt{4}\}$
B. $\{-4 \pm \sqrt{10}\}$
C. $\{4 \pm \sqrt{10}\}$
D. $\{10 \pm \sqrt{4}\}$

73. **Which expression represents the solutions for the equation** $3m^2 + 8m + 2 = 0$?

A. $\frac{-4 \pm \sqrt{10}}{3}$
B. $\frac{-4 \pm 2\sqrt{10}}{3}$
C. $\frac{-4 \pm \sqrt{22}}{3}$
D. $\frac{-4 \pm 2\sqrt{22}}{3}$

74. **Which expression represents the solutions of the equation** $3n^2 - 8n - 1 = 0$?

A. $\frac{4 \pm \sqrt{13}}{3}$
B. $\frac{4 \pm 2\sqrt{13}}{3}$
C. $\frac{4 \pm \sqrt{19}}{3}$
D. $\frac{4 \pm 2\sqrt{19}}{3}$

75. **Which statement is true for the equation** $x^2 + 2x + 3 = x^2 + 2x + 5$?

A. The equation is never true.
B. The equation is true for all values of *x*.
C. The equation is only true for positive values of *x*.
D. The equation is only true for negative values of *x*.

76. **A pen is dropped on the moon. The acceleration due to gravity on the moon is 1.67 meters per second squared. The pen is falling at a rate of 2 meters per second when it is 8 meters from the ground. The equation that models this is** $0.5(1.67)t^2 + 2t - 8 = 0$, **where *t* is the time in seconds.**

Approximately how many seconds will it take for the pen to reach the ground?

A. 1.66
B. 2.12
C. 4.51
D. 7.18

77. **An equation in the form $ax^2 + bx + c = 0$ is solved by the quadratic formula. The solution to the equation is shown below.**

$$x = \frac{-6 \pm \sqrt{44}}{2}$$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1,\ b = 6,\ c = -2$
B. $a = 1,\ b = -6,\ c = -2$
C. $a = 2,\ b = -6,\ c = -2$
D. $a = 2,\ b = 6,\ c = -2$

78. **What is the solution set for the equation $x^2 + 9x = -5$?**

A. $\left\{\frac{-9 \pm \sqrt{61}}{2}\right\}$
B. $\left\{\frac{9 \pm \sqrt{61}}{2}\right\}$
C. $\left\{\frac{-9 \pm \sqrt{101}}{2}\right\}$
D. $\left\{\frac{9 \pm \sqrt{101}}{2}\right\}$

79. **What are the roots of the equation $4r^2 - 8r - 1 = 0$?**

A. $\frac{2+\sqrt{3}}{2}, \frac{-2+\sqrt{3}}{2}$
B. $\frac{2+\sqrt{3}}{2}, \frac{2-\sqrt{3}}{2}$
C. $\frac{2+\sqrt{5}}{2}, \frac{-2+\sqrt{5}}{2}$
D. $\frac{2+\sqrt{5}}{2}, \frac{2-\sqrt{5}}{2}$

80. **What is the solution set of the equation $(x + 4)^2 = 25$?**

A. $\{-29, 21\}$
B. $\{-21, 29\}$
C. $\{-9, 1\}$
D. $\{-1, 9\}$

81. **What value of *x* makes the equation $4 - x^2 = 1 - x$ true?**

A. $\frac{1 \pm \sqrt{13}}{-2}$

B. $\frac{1 \pm \sqrt{13}}{2}$

C. $\frac{1 \pm \sqrt{21}}{-2}$

D. $\frac{1 \pm \sqrt{21}}{2}$

82. **The formula below gives the acceleration (*a*) of an object moving in a circular path at a constant speed. Let *r* represent the length of the radius of the circular path, and let *v* represent the constant speed of the object.**

$$a = \frac{v^2}{r}$$

Janis is riding a bicycle on a circular training track with a radius of 54 meters. If her acceleration is 6 meters/second^2, at what speed is she traveling in meters/second?

A. 9

B. 18

C. 162

D. 324

83. **What number should be added to both sides of the equation below if you were going to solve the equation by completing the square?**

$$x^2 + \frac{1}{3}x = 4$$

A. $\frac{1}{36}$

B. $\frac{1}{9}$

C. $\frac{1}{3}$

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

84. **An equation in the form $ax^2 + bx + c = 0$ is solved by the quadratic formula. The solution to the equation is shown below.**

$$x = \frac{-7 \pm \sqrt{53}}{2}$$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1,\ b = 7,\ c = -1$

B. $a = 1,\ b = -7,\ c = -1$

C. $a = 2,\ b = -7,\ c = -1$

D. $a = 2,\ b = 7,\ c = -1$

85. **What is the value of this expression for** $a = 1, b = 4,$ **and** $c = -1$?

$$\frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

A. $-2 + \sqrt{3}$
B. $-2 + \sqrt{5}$
C. $2 - \sqrt{3}$
D. $2 - \sqrt{5}$

86. **Which statement is true for the equation** $3(x-1)^2 = 2(x-1)$?

A. The equation is never true.
B. The equation is true for all values of *x*.
C. The equation is true for some positive values of *x*.
D. The equation is true for some negative values of *x*.

87. **What is the solution set for the equation** $3x^2 + 2x - 5 = 0$?

A. $\left\{-1, \frac{-2}{3}\right\}$
B. $\left\{-1\frac{2}{3}, 1\right\}$
C. $\left\{-\frac{1}{3}, 2\right\}$
D. $\left\{\frac{2}{3}, 1\right\}$

88. **A projectile was projected into the air off a rooftop with an initial velocity at 32 feet per second. The quadratic equation** $h = -16t^2 + 32t + 240$ **represents the height, *h,* of the projectile *t* seconds after it was projected into the air. According to the equation, how many seconds should it take for the projectile to hit the ground?**

A. 3
B. 5
C. 7.5
D. 15

89. **What are the values of *x* in the equation** $(x+3)^2 = 6$?

A. $\{-6 \pm \sqrt{3}\}$
B. $\{-3 \pm \sqrt{6}\}$
C. $\{3 \pm \sqrt{6}\}$
D. $\{6 \pm \sqrt{3}\}$

90. **A ball is thrown upward from the top of a building that is 240 feet tall. The distance, *d*, between the ball and the ground *t* seconds after being thrown is given by the equation $d = -16t^2 + 32t + 240$. After how many seconds will the ball hit the ground?**

A. 2
B. 3
C. 5
D. 15

91. Eric is solving the equation $x^2 - 5x + 6 = 0$ using the steps below.

Step 1: $x^2 - 5x = -6$
Step 2: $x^2 - 5x + 25 = -6 + 25$
Step 3: $(x-5)^2 = 19$
Step 4: $x - 5 = \pm\sqrt{19}$

Eric finds out that his final answer is incorrect. During which step did Eric make his initial error?

A. Step 1
B. Step 2
C. Step 3
D. Step 4

92. **Which quadratic function has 3 as its only root?**

A. $f(x) = x^2 - 9$
B. $f(x) = x^2 + 9$
C. $f(x) = x^2 - 6x + 9$
D. $f(x) = x^2 + 6x + 9$

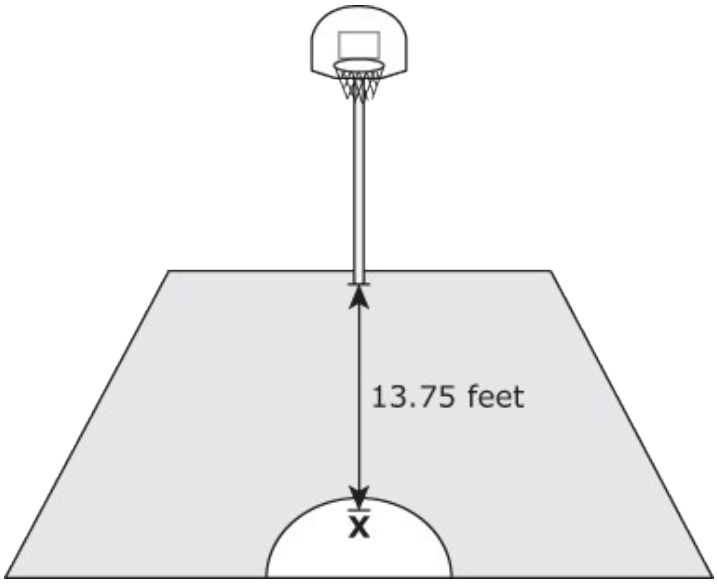
93. **Which of the following equations is most likely to be a step in the solution of $x^2 + 4x - 6 = 0$ by completing the square?**

A. $(x+2)^2 = 6$
B. $(x+2)^2 = 10$
C. $(x+4)^2 = 10$
D. $(x+4)^2 = 22$

94. **A man drops a ball from the top of a 300 foot cliff. The height of the falling ball is modeled by $h(t) = -16t^2 + 300$ where *h* is in feet and *t* is in seconds. How long does it take for the ball to be 44 feet above the ground?**

A. 4 seconds
B. 9 seconds
C. 16 seconds
D. 19 seconds

95. Robert stands 13.75 feet from a basketball hoop, ready to shoot a basketball. The rim of the basketball hoop is 10 feet above the floor.



When Robert shoots the basketball, the following formula calculates *y*, the height of the basketball (in feet) as a function of *x*, its horizontal distance (in feet) from its initial point of release.

$$y = -\frac{5}{42}x^2 + \frac{97}{50}x + 6$$

As the basketball approaches the hoop, it will go through the hoop if the formula indicates that the ball's horizontal distance is between 13.55 and 13.95 feet when its height is 10.0 feet. Does the ball go through the hoop; why or why not?

A. No, it will not go through the hoop because the ball is 11.33 feet away from the basketball hoop when it reaches a height of 10.0 feet.

B. No, the ball will not go through the hoop because the ball was 13.75 feet away from the basketball hoop when it reaches a height of 10.0 feet.

C. Yes, the ball goes through the hoop because the ball is 0.12 feet away from the basketball hoop when it reaches a height of 10.0 feet.

D. Yes, the ball will go through the hoop because the ball is 0.17 feet away from the basketball hoop when it reaches a height of 10.0 feet.

96. **What is the solution set for the equation** $x^2 + 7x + 12 = 0$?

A. $\{-6, -2\}$
B. $\{-4, -3\}$
C. $\{2, 6\}$
D. $\{3, 4\}$

97. **To find the roots of the quadratic equation** $2x^2 - 3x + 1 = 0$, **Carla correctly applied the quadratic formula. Which equation represents the correct application of the quadratic formula?**

A. $x = \frac{-3 \pm \sqrt{(-3)^2 - 4(2)(1)}}{2(2)}$
B. $x = \frac{-3 \pm \sqrt{(-3)^2 - 4(-3)(1)}}{2(2)}$
C. $x = \frac{-(-3) \pm \sqrt{(3)^2 - 4(3)(1)}}{2(2)}$
D. $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(1)}}{2(2)}$

98. **Which equation has roots of −7 and 4?**

A. $(x + 7)(x - 4) = 0$
B. $(x - 7)(x + 4) = 0$
C. $(x - 7)(x - 4) = 0$
D. $(x + 7)(x + 4) = 0$

99. **What is the solution set for** $(x - 2)^2 - 16 = 0$?

A. $\{6\}$
B. $\{18\}$
C. $\{-6, 2\}$
D. $\{-2, 6\}$

100. **An equation in the form** $ax^2 + bx + c = 0$ **is solved by the quadratic formula. The solution to the equation is shown below.**

$$x = \frac{-3 \pm \sqrt{17}}{2}$$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1,\ b = 3,\ c = -2$
B. $a = 1,\ b = -3,\ c = -2$
C. $a = 2,\ b = -3,\ c = -1$
D. $a = 2,\ b = 3,\ c = -1$

101. **What are the roots of the equation** $2x^2 + 1 = 5x$?

A. $\frac{-5 \pm \sqrt{17}}{4}$

B. $\frac{-5 \pm \sqrt{17}}{2}$

C. $\frac{5 \pm \sqrt{17}}{4}$

D. $\frac{5 \pm \sqrt{17}}{2}$

102. **Which expression represents a solution to the equation** $x^2 + 2x - 10 = 0$?

A. $x = 1 - 2\sqrt{11}$

B. $x = 1 - \sqrt{11}$

C. $x = -1 + \sqrt{11}$

D. $x = -1 + 2\sqrt{11}$

103. **Which expression represents the proper use of the quadratic formula to solve the equation** $2x^2 + 7x - 6 = 0$?

A. $\frac{-7 \pm \sqrt{49 - 48}}{4}$

B. $\frac{-7 \pm \sqrt{49 + 48}}{4}$

C. $\frac{7 \pm \sqrt{49 - 48}}{4}$

D. $\frac{7 \pm \sqrt{49 + 48}}{4}$

104. **What are the solutions to** $2x^2 + 3x + 4 = 0$ **using the quadratic formula?**

A. $-\frac{3}{4} \pm \frac{i\sqrt{23}}{4}$

B. $-\frac{3}{4} \pm \frac{\sqrt{41}}{4}$

C. $\frac{3}{4} \pm \frac{i\sqrt{23}}{4}$

D. $\frac{3}{4} \pm \frac{\sqrt{41}}{4}$

105. **An object fell to the ground from a height of 288 feet. The equation $0 = 288 - 48t - 16t^2$ can be used to determine *t*, the time in seconds it took for the object to hit the ground. At what time did the object hit the ground?**

A. 2 seconds

B. 3 seconds

C. 6 seconds

D. 9 seconds

106. **The period of a pendulum is the time it takes for the pendulum to swing and return to its original position. The relationship between the period *t*, in seconds and *l*, the length of a pendulum in meters, can be approximated by the equation $t^2 - 4l = 0$. Which time is closest to the period of a pendulum 6 meters long?**

A. 5 seconds
B. 6 seconds
C. 9 seconds
D. 24 seconds

107. **What is the solution set of the equation $3x^2 + 23x - 8 = 0$?**

A. $\left\{-8, \frac{1}{3}\right\}$
B. $\left\{-\frac{8}{3}, 1\right\}$
C. $\left\{-1, \frac{8}{3}\right\}$
D. $\left\{-\frac{1}{3}, 8\right\}$

108. What is the set of solutions for $3x^2 - 12x = 10$, rounded to the nearest tenth?

A. $x = \{0.2, -4.2\}$
B. $x = \{-1.7, 5.7\}$
C. $x = \{-0.7, 4.7\}$
D. $x = \{1.2, 2.8\}$

109. **What are the *x*-intercepts of the graph of $y = 3x^2 + 2x - 2$?**

A. $\frac{-1-\sqrt{5}}{3}$ and $\frac{-1+\sqrt{5}}{3}$
B. $\frac{-1-\sqrt{7}}{3}$ and $\frac{-1+\sqrt{7}}{3}$
C. $\frac{-1-2\sqrt{7}}{3}$ and $\frac{-1+2\sqrt{7}}{3}$
D. $\frac{-1+4\sqrt{5}}{3}$ and $\frac{-1-4\sqrt{5}}{3}$

110. **What is the solution set for the quadratic equation below?**

$4k^2 + 12k + 8 = 0$

A. $\{-4, -2, -1\}$

B. $\{-2, -1\}$

C. $\{1, 2\}$

D. $\{1, 2, 4\}$

111. Solve $2x^2 - 3x - 9 = 0$ for x.

A. $x = -\frac{3}{2}$ or $x = -3$

B. $x = -\frac{3}{2}$ or $x = 3$

C. $x = \frac{3}{2}$ or $x = -3$

D. $x = \frac{9}{2}$ or $x = -1$

112. **What are the roots of the equation** $3p^2 - 8p - 2 = 0$?

A. $\frac{4+\sqrt{10}}{3}, \frac{4-\sqrt{10}}{3}$

B. $\frac{4+\sqrt{10}}{3}, \frac{-4+\sqrt{10}}{3}$

C. $\frac{4+\sqrt{22}}{3}, \frac{4-\sqrt{22}}{3}$

D. $\frac{4+\sqrt{22}}{3}, \frac{-4+\sqrt{22}}{3}$

113. **To solve the equation** $x^2 + x = 5$ **by completing the square, what number should Marisol add to both sides of the equation?**

A. -5

B. $\frac{1}{4}$

C. $\frac{1}{2}$

D. 1

114. **If** $3x^2 + 11x + 5 = 0$, then $x =$

A. $\frac{-11 \pm \sqrt{61}}{2}$

B. $\frac{-11 \pm \sqrt{61}}{6}$

C. $\frac{-11 \pm \sqrt{181}}{2}$

D. $\frac{-11 \pm \sqrt{181}}{6}$

115. What are the solutions to the equation $13x^2 - 17x + 7 = 0$?

A. $\frac{17+5\sqrt{3}}{26}; \frac{17-5\sqrt{3}}{26}$

B. $\frac{17+5i\sqrt{3}}{26}; \frac{17-5i\sqrt{3}}{26}$

C. $\frac{-17+5\sqrt{3}}{26}; \frac{-17-5\sqrt{3}}{26}$

D. $\frac{-17+5i\sqrt{3}}{26}; \frac{-17-5i\sqrt{3}}{26}$

116. **Bill knows that the sum, *S*, of the first *n* positive even integers can be found using the formula $S = n(n+1)$. He added the first *n* positive even integers, and the sum was 380. What is the value of *n*?**

A. 19
B. 20
C. 38
D. 39

117. **From a cliff, a ball was thrown downward at an initial velocity of 28 feet per second. The distance the ball had fallen is given by the function $d(t) = 16t^2 + 28t$, where *t* is the time elapsed in seconds. If the ball took 2 seconds to hit the ground below the cliff, how many seconds did the ball take to fall $\frac{1}{4}$ of the way to the ground?**

A. 0.125
B. 0.5
C. 0.75
D. 1.0

118. **Use the quadratic formula to solve $-2x^2 + 9x - 11 = 0$.**

A. $x = -5\frac{3}{4}$ and $-12\frac{1}{4}$

B. $x = \frac{9}{4} \pm \frac{\sqrt{7}}{4}$

C. $x = -1$ and $\frac{11}{2}$

D. no real solutions

119. **If the quadratic formula is used to solve $-3x^2 + 5x - 1 = 0$, what value should be substituted for *n* in the equation below?**

$$x = \frac{n \pm \sqrt{13}}{-6}$$

A. -5
B. -1
C. 1
D. 5

120. **A ball is thrown in the air. The relationship between the time the ball is in the air, *t* (in seconds), and the height of the ball in feet above the ground (*h*) is represented by $h = -16t^2 + 20t + 6$. How many seconds will it take for the ball to hit the ground?**

A. $\frac{1}{4}$
B. $\frac{3}{8}$
C. 1.5
D. 6

121. **What is the solution set for $x^2 - x = 6$?**

A. $\{-6, 1\}$
B. $\{-3, 2\}$
C. $\{-2, 3\}$
D. $\{-1, 6\}$

122. **What are the solutions of the equation $x^2 + x - 12 = 0$?**

A. $\frac{-1 \pm \sqrt{47}}{2}$
B. $\frac{1 \pm \sqrt{47}}{2}$
C. $-4, 3$
D. $-3, 4$

123. **Karen is solving the quadratic equation shown below.**

$$x^2 + 12x - 1 = 0$$
$$x^2 + 12x - 1 + 1 = 0 + 1$$
$$x^2 + 12x = 1$$

Which equation best represents the next step Karen would use to solve for *x* by completing the square?

A. $x^2 + 12x + 6 = 1 + 6$
B. $x^2 + 12x + 24 = 1 + 24$
C. $x^2 + 12x + 36 = 1 + 36$
D. $x^2 + 12x + 144 = 1 + 144$

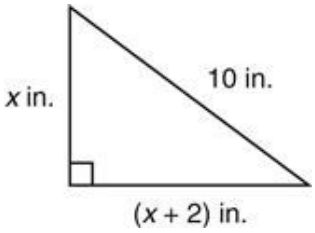
124. **What are all values of *x* for which $(x-3)(x+5)=0$?**

A. $x = 3$ and $x = 5$
B. $x = 3$ and $x = -5$
C. $x = -3$ and $x = 5$
D. $x = -3$ and $x = -5$

125. **A ball is thrown in the air. The function $h = 30t - 5t^2$ can be used to find the height (*h*) of the ball in meters after *t* seconds. How long does it take the ball to reach a height of 45 meters?**

A. $1\frac{4}{5}$ seconds
B. 3 seconds
C. 5 seconds
D. 6 seconds

126. **A right triangle is shown below.**



The relationship between the 3 sides of the triangle is represented by the equation $x^2 + (x+2)^2 = 10^2$. What is the length, in inches, of the shortest side?

A. 2
B. 6
C. 7
D. 8

127. **The quadratic formula is used to solve $x^2 - 7x + 2 = 0$. What value should be substituted for *n* in the following equation?**

$$x = \frac{7 \pm \sqrt{n}}{2}$$

A. 6
B. 22
C. 41
D. 57

128. **Which value should be substituted for *n* in the quadratic formula to solve $x^2 - 3x + 1 = 0$?**

$$x = \frac{3 \pm \sqrt{n}}{2}$$

A. 2
B. 5
C. 10
D. 13

129. **If $x \neq 0$, which value of *x* is the solution to $x^2 = 9x$?**

A. $x = -9$
B. $x = -3$
C. $x = 3$
D. $x = 9$

130. **What is the solution set to the equation $x^2 - 3x - 18 = 10$?**

A. $\{-7, -4\}$
B. $\{-7, 4\}$
C. $\{-4, 7\}$
D. $\{4, 7\}$

131. **What is the value of *b* if (3 + *i*) and (3 – *i*) are complex roots of $2x^2 + bx + 20 = 0$?**

A. –12
B. –6
C. 6
D. 10

132. **What are the roots of the equation $2x^2 + 7x + 4 = 0$?**

A. $\frac{-7 \pm \sqrt{17}}{4}$
B. $\frac{-7 \pm \sqrt{17}}{2}$
C. $\frac{7 \pm \sqrt{17}}{4}$
D. $\frac{7 \pm \sqrt{17}}{2}$

133. **What is the solution set for the equation $x^2 + 12x + 20 = 0$?**

A. $\{-5, -4\}$
B. $\{-10, -2\}$
C. $\{2, 10\}$
D. {4, 5}

134. **Which expression represents the solutions for the equation $2x^2 + 6x - 1 = 0$?**

A. $\frac{-3 \pm \sqrt{7}}{2}$
B. $\frac{-3 \pm 2\sqrt{7}}{2}$
C. $\frac{-3 \pm \sqrt{11}}{2}$
D. $\frac{-3 \pm 2\sqrt{11}}{2}$

135. **An object is thrown upward out of a building window. The equation $h = -16t^2 + 40t + 24$ models the height in feet, *h*, of the object above the ground *t* seconds after it is thrown. How long does it take for the object to hit the ground?**

A. $\frac{1}{2}$ second
B. 1 second
C. $1\frac{1}{2}$ seconds
D. 3 seconds

136. **Caleb kicked a ball. The function $h(t) = -16t^2 + 80t$ describes the height of the ball, in feet, *t* seconds after he kicked it. How many seconds did the ball take to first reach 64 feet?**

A. 0
B. 1
C. 5
D. 8

137. **The steps below show an attempt to solve $2x^2 - 2x + 9 = 0$.**

$$\text{Step 1}: \ x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(9)}}{(2)(2)}$$

$$\text{Step 2}: \ x = \frac{2 \pm i\sqrt{68}}{4}$$

$$\text{Step 3}: \ x = \frac{1 \pm i\sqrt{34}}{2}$$

$$\text{Step 4}: \ x \in \left\{\frac{1 \pm i\sqrt{34}}{2}\right\}$$

In which step does the first error occur?

A. Step 1
B. Step 2
C. Step 3
D. Step 4

138. **An equation in the form $ax^2 + bx + c = 0$ is solved by the quadratic formula. The solution to the equation is shown below.**

$$x = \frac{-7 \pm \sqrt{57}}{2}$$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1, \ b = -7, \ c = -2$
B. $a = 1, \ b = 7, \ c = -2$
C. $a = 2, \ b = -7, \ c = -1$
D. $a = 2, \ b = 7, \ c = -1$

139. **What is the solution set for the equation** $3x^2 + 10x - 8 = 0$?

A. $\left\{-4, \frac{2}{3}\right\}$

B. $\left\{-2, \frac{4}{3}\right\}$

C. $\left\{-\frac{4}{3}, 2\right\}$

D. $\left\{-\frac{2}{3}, 4\right\}$

140. **What is the solution set for the equation** $2x^2 - 7x + 1 = 0$?

A. $\left\{\frac{-7 \pm \sqrt{41}}{2}\right\}$

B. $\left\{\frac{7 \pm \sqrt{41}}{2}\right\}$

C. $\left\{\frac{-7 \pm \sqrt{41}}{4}\right\}$

D. $\left\{\frac{7 \pm \sqrt{41}}{4}\right\}$

141. **For what values of *x* does** $2x^2 - 5x - 12 = 0$?

A. $-4 \text{ and } \frac{2}{3}$

B. $-4 \text{ and } \frac{3}{2}$

C. $4 \text{ and } -\frac{3}{2}$

D. $4 \text{ and } -\frac{2}{3}$

142. **What is the solution set of the equation** $2x^2 - 5x - 12 = 0$?

A. $\{-8, 3\}$

B. $\left\{-4, \frac{3}{2}\right\}$

C. $\left\{4, -\frac{3}{2}\right\}$

D. $\{8, -3\}$

143. **What are the solutions for the equation $5x^2 + x - 4 = 0$?**

A. $-\frac{5}{4}$ and 1

B. $\frac{5}{4}$ and -1

C. $-\frac{4}{5}$ and 1

D. $\frac{4}{5}$ and -1

144. **The steps for solving quadratic equation $x^2 - 4x + 2 = 0$ by completing the square, are given below.**

Step 1: $x^2 - 4x = -2$
Step 2: $x^2 - 4x + 4 = 2$
Step 3:

To continue the solution correctly by completing the square, what should be Step 3?

A. $x - 2 = 2$

B. $(x + 2)^2 = 2$

C. $(x - 2)^2 = 2$

D. $(x - 2)(x + 2) = 2$

145. **What are the solutions to the equation $x^2 - 16 = 0$?**

A. $x = -8 \text{ or } x = -2$

B. $x = -4 \text{ or } x = 4$

C. $x = 2 \text{ or } x = 8$

D. $x = 4 \text{ or } x = \sqrt{-16}$

146. **The equation $2w^2 - 18w + 40 = 0$ can be solved to determine *w*, the width in feet of a rectangular enclosure. Which value represents a possible width of the rectangular enclosure?**

A. 2 feet

B. 2.5 feet

C. 4 feet

D. 8 feet

147. **What are the roots of the equation $x^2 + 5x - 3 = 0$?**

A. $\frac{-5 \pm \sqrt{13}}{2}$

B. $\frac{5 \pm \sqrt{13}}{2}$

C. $\frac{-5 \pm \sqrt{37}}{2}$

D. $\frac{5 \pm \sqrt{37}}{2}$

148. **What are the roots of the equation** $2y^2 - 6y - 3 = 0$?

A. $\frac{3+\sqrt{3}}{2}, \frac{3-\sqrt{3}}{2}$

B. $\frac{3+\sqrt{3}}{2}, \frac{-3+\sqrt{3}}{2}$

C. $\frac{3+\sqrt{15}}{2}, \frac{3-\sqrt{15}}{2}$

D. $\frac{3+\sqrt{15}}{2}, \frac{-3+\sqrt{15}}{2}$

149. **A farmer has 50 feet of fencing to enclose a rectangular garden with an area of exactly 144 square feet. The area of the garden can be modeled by the equation** $x(25 - x) - 144 = 0$, **where *x* represents the length of the garden. What is the length of the garden?**

A. 0

B. 12

C. 16

D. 25

150. **Use the quadratic formula to solve** $y^2 + 7y = 6$.

A. $y = \frac{-7 \pm \sqrt{73}}{2}$

B. $y = -7 \pm \frac{\sqrt{73}}{2}$

C. $y = -6 \text{ or } -1$

D. $y = -9\frac{1}{2} \text{ or } -4\frac{1}{2}$

151. **Myra's tutor used these steps to solve the problem** $10x^2 = 90$.

- **Divide both sides by 10 to get** $x^2 = 9$.
- **Take square roots on both sides to get** $x = \pm 3$.

Using this method, what is the solution to $7x^2 = 1008$?

A. ± 3

B. ± 7

C. ± 12

D. ± 144

152. Which quadratic equation has $\frac{5 \pm \sqrt{13}}{2}$ as its roots?

A. $x^2 - 5x + 3 = 0$

B. $x^2 - 5x - 3 = 0$

C. $x^2 + 5x + 3 = 0$

D. $x^2 + 5x - 3 = 0$

153. **Which of the numbers is one root of the equation $x^2 - 8x - 2 = 0$?**

A. $4 + \sqrt{14}$
B. $4 + 3\sqrt{2}$
C. $4 + 6\sqrt{2}$
D. $4 + 2\sqrt{14}$

154. What are the solutions to the equation below?

$3x^2 - 5x - 7 = 0$

A. $\frac{-5 \pm \sqrt{109}}{2}$

B. $\frac{-5 \pm \sqrt{109}}{6}$

C. $\frac{5 \pm \sqrt{109}}{2}$

D. $\frac{5 \pm \sqrt{109}}{6}$

155. **What is the solution set for the equation $x^2 + x - 42 = 0$?**

A. $\{-7, 6\}$
B. $\{-6, 7\}$
C. $\{6\}$
D. $\{7\}$

156. What values of *a* result in the equation $ax^2 - 12x - 3 = 6$ having complex solutions?

A. $a < -12$

B. $a < -4$

C. $a > 4$

D. $a > 16$

157. **If $x(x + 2) = 8$, then $x =$**

A. $0 \text{ or } -2$
B. 0 or 4
C. $2 \text{ or } -4$
D. 6 or 8

158. **What are the roots of the equation $3x^2 - 9x - 5 = 0$?**

A. $\frac{-9 \pm \sqrt{21}}{6}$
B. $\frac{-9 \pm \sqrt{141}}{6}$
C. $\frac{9 \pm \sqrt{21}}{6}$
D. $\frac{9 \pm \sqrt{141}}{6}$

159. **Which function has two negative roots?**

A. $f(x) = -x^2 - 8x + 12$
B. $f(x) = x^2 - 5x - 14$
C. $f(x) = x^2 - 10x + 16$
D. $f(x) = x^2 + 9x + 18$

160. **Using factoring, what is the solution set to the equation $t^2 - 7t + 12 = 0$?**

A. $\{-3, -4\}$
B. $\{-2, -6\}$
C. $\{3, 4\}$
D. $\{5, 7\}$

161. **What are the solutions for x in the equation $x^2 + 6x + 3 = 0$?**

A. $x = 6$ or $x = 3$
B. $x = -2 \text{ or } x = -3$
C. $x = -3 + 2\sqrt{3} \text{ or } x = -3 - 2\sqrt{3}$
D. $x = -3 + \sqrt{6} \text{ or } x = -3 - \sqrt{6}$

162. **What are the x-intercepts of the graph of the equation $y = 2x^2 + x - 3$?**

A. $-\frac{3}{2} \text{ and } -1$
B. $-\frac{3}{2} \text{ and } 1$
C. $\frac{3}{2} \text{ and } -1$
D. $\frac{3}{2} \text{ and } 1$

163. **What are the roots of the equation** $3x^2 + 6x + 1 = 0$?

A. $\frac{-3 \pm \sqrt{6}}{3}$

B. $\frac{-1 \pm \sqrt{6}}{3}$

C. $\frac{1 \pm \sqrt{6}}{3}$

D. $\frac{3 \pm \sqrt{6}}{3}$

164. **What is the solution set for the following equation?**

$x^2 - 11x = 12$

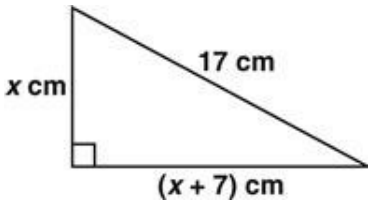
A. $\{-12, 1\}$

B. $\{-1, 12\}$

C. $\{1, 12\}$

D. $\{12, 23\}$

165. **The relationship between the 3 sides of a right triangle is represented by the equation** $x^2 + (x + 7)^2 = 17^2$.



What is the length, in centimeters, of the shortest side?

A. 5

B. 8

C. 10

D. 15

166. **What is the solution set of the equation** $(x - 9)(x) = 2x - 5x - 8$?

A. $\{2, 4\}$

B. $\{2, -4\}$

C. $\{-2, 4\}$

D. $\{-2, -4\}$

167. **What are the solutions to the equation below?**

$x^2 - 6x = -3$

A. $x = -3 \pm 2\sqrt{6}$
B. $x = -3 \pm \sqrt{6}$
C. $x = 3 \pm 2\sqrt{6}$
D. $x = 3 \pm \sqrt{6}$

168. **Which quadratic equation has these solutions:** $-\frac{9}{4}, 7$?

A. $4x^2 - 63x + 4 = 0$
B. $4x^2 - 19x - 63 = 0$
C. $4x^2 + 19x - 63 = 0$
D. $4x^2 + 4x - 63 = 0$

169. **What are all values of *x* for which** $x(x - 4) = 0$?

A. $x = 4$ only
B. $x = 0$ and $x = 4$
C. $x = 2$ and $x = -2$ only
D. $x = 0$ and $x = 2$ and $x = -2$

170. **Which value of *x* is a possible solution to** $(2x - 10)(3x + 12) = 0$?

A. $x = -36$
B. $x = -20$
C. $x = -5$
D. $x = -4$

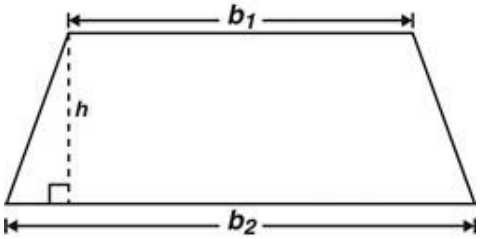
171. An equation in the form $ax^2 + bx + c = 0$ **is solved by the quadratic formula. The solution to the equation is shown below.**

$x = \frac{9 \pm \sqrt{89}}{2}$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1,\ b = -9,\ c = 2$
B. $a = 1,\ b = -9,\ c = -2$
C. $a = 1,\ b = 9,\ c = 2$
D. $a = 1,\ b = 9,\ c = -2$

172. **The area of a trapezoid can be found by the formula** $A = \frac{1}{2}h(b_1 + b_2)$.



The area of this trapezoid is 12 square inches. If $b_1 = h$ **and** $b_2 = h + 8$, **what is the length of *h*?**

A. 2
B. 6
C. 8
D. 10

173. **What are the values of *x* in the equation** $(x - 8)^2 = 7$?

A. $\{8 \pm \sqrt{7}\}$
B. $\{7 \pm \sqrt{8}\}$
C. $\{-7 \pm \sqrt{8}\}$
D. $\{-8 \pm \sqrt{7}\}$

174. **Use the quadratic formula to solve** $y^2 + 5y = 4$.

A. $y = -\frac{5}{2} \pm \frac{\sqrt{41}}{2}$
B. $y = -5 \pm \frac{\sqrt{41}}{2}$
C. $y = -4$ or -1
D. $y = -6\frac{1}{2}$ or $-3\frac{1}{2}$

175. **What number must be added to both sides of the equation** $x^2 - \frac{5}{2}x = 3$ **to solve the equation by completing the square?**

A. $\frac{4}{25}$
B. $\frac{5}{4}$
C. $\frac{25}{16}$
D. $\frac{25}{4}$

176. **A ball is thrown upward at a velocity of 16 feet per second from a height that is 60 feet above the ground. The height, *h* (in feet) of the ball at time, *t* (in seconds), after it is thrown, can be found by the formula below.**

$h = -16t^2 + 16t + 60$

Find the time, in seconds, when the ball is again 60 feet above the ground.

A. 1
B. $\frac{3}{2}$
C. 2
D. $\frac{5}{2}$

177. **In solving the quadratic equation $x^2 - 6x - 7 = 0$ by completing the square, the following steps are given.**

Step 1: $x^2 - 6x = 7$
Step 2: $x^2 - 6x + 9 = 7 + 9$
Step 3:

To continue to solve by completing the square, what should be Step 3?

A. $x - 3 = 16$
B. $(x - 3)^2 = 16$
C. $(x + 3)^2 = 16$
D. $(x + 3)(x - 3) = 16$

178. **Andrew dropped a rock from a cliff 49 meters high. The function $h(t) = -4.9t^2 + 49$ represents the height of the rock, in meters, *t* seconds after he dropped it. Approximately how many seconds did the rock take to reach the ground?**

A. 3
B. 4
C. 10
D. 49

179. **What is the solution set of the equation $x^2 - 6x = 40$?**

A. $\{-10, -4\}$
B. $\{-10, 4\}$
C. $\{-4, 10\}$
D. $\{4, 10\}$

180. **Which quadratic equation has $\frac{-1 \pm \sqrt{13}}{2}$ as its roots?**

A. $x^2 - x - 3 = 0$
B. $x^2 - x + 3 = 0$
C. $x^2 + x - 3 = 0$
D. $x^2 + x + 3 = 0$

181. **The sum, *S*, of *n* consecutive positive integers is given by the formula $S = \frac{n}{2}(n+1)$. If the sum of *n* consecutive positive integers is 66, what is the value of *n*?**

A. 11
B. 12
C. 23
D. 33

182. **A ball is thrown upward from the top of a building 320 feet tall. The height, *h*, of the ball *t* seconds after being thrown is given by the equation $h = -16t^2 + 16t + 320$. After how many seconds will the ball hit the ground?**

A. 1
B. 4
C. 5
D. 20

183. What values of *x* satisfy $2x^2 - 4x + 5 = 0$?

A. $\left\{-1+\frac{\sqrt{6}}{2}, -1-\frac{\sqrt{6}}{2}\right\}$

B. $\left\{-1+\frac{\sqrt{6}}{2}i, -1-\frac{\sqrt{6}}{2}i\right\}$

C. $\left\{1+\frac{\sqrt{6}}{2}, 1-\frac{\sqrt{6}}{2}\right\}$

D. $\left\{1+\frac{\sqrt{6}}{2}i, 1-\frac{\sqrt{6}}{2}i\right\}$

184. **Which is the first step in solving $x^2 + 8x - 12 = 0$ by completing the square?**

A. add 12 to both sides
B. divide each term by 8
C. subtract 12 from both sides
D. subtract 8*x* from both sides

185. **A ball is thrown into the air. The function $h = 20t - 5t^2$ can be used to find the height (*h*) of the ball in meters after *t* seconds. How long does it take for the ball to reach a height of 20 meters?**

A. $\frac{4}{5}$ second
B. 2 seconds
C. 4 seconds
D. 5 seconds

186. **What are the roots of** $3x^2 - ?5x - 6 = 0?$

A. $\frac{-5 \pm \sqrt{97}}{6}$

B. $\frac{5 \pm \sqrt{97}}{3}$

C. $\frac{5 \pm \sqrt{43}}{6}$

D. $\frac{5 \pm \sqrt{97}}{6}$

187. **John solved the equation** $2x^2 + x = 7$ **by using the quadratic formula. His work is shown below.**

$x = \frac{n \pm \sqrt{57}}{4}$

What value should John substitute for *n* found in the equation above?

A. -7

B. -1

C. 1

D. 7

188. **What are the solutions for the equation** $x^2 - 5x = 6?$

A. $-6,\ 1$

B. $-3,\ -2$

C. $-1,\ 6$

D. $2,\ 3$

189. **What are the solutions to the equation** $4x^2 + 7x - 2 = 0?$

A. -2 or $\frac{1}{4}$

B. -1 or $\frac{1}{2}$

C. 1 or $-\frac{1}{2}$

D. 2 or $-\frac{1}{4}$

190. **To solve the quadratic equation $x^2 - 12x - 64 = 0$ by completing the square, the following steps are given.**

Step 1: $x^2 - 12x = 64$
Step 2: $x^2 - 12x + 36 = 100$
Step 3: ?

To continue the solution correctly by completing the square, what should Step 3 be?

A. $(x - 6)(x + 6) = 100$
B. $x^2 = 12x + 64$
C. $(x - 6)^2 = 100$
D. $x - 6 = 100$

191. **What number should be added to both sides of the equation below to solve the equation by completing the square?**

$x^2 + \frac{1}{5}x = 3$

A. $\frac{1}{100}$
B. $\frac{1}{25}$
C. $\frac{1}{5}$
D. $\frac{2}{5}$

192. **The area of a rectangle can be represented by the expression $4x^2 + 8x + 9$. If the area of the rectangle is 69 square inches, what is the value of *x*, the width of the rectangle, in inches?**

A. 3 inches
B. 4 inches
C. 5 inches
D. 6 inches

193. **What is the solution set for the equation $x^2 = -3x + 6$?**

A. $\left\{\frac{-3 + \sqrt{15}}{2}, \frac{-3 - \sqrt{15}}{2}\right\}$
B. $\left\{\frac{3 + \sqrt{15}}{2}, \frac{3 - \sqrt{15}}{2}\right\}$
C. $\left\{\frac{-3 + \sqrt{33}}{2}, \frac{-3 - \sqrt{33}}{2}\right\}$
D. $\left\{\frac{3 + \sqrt{33}}{2}, \frac{3 - \sqrt{33}}{2}\right\}$

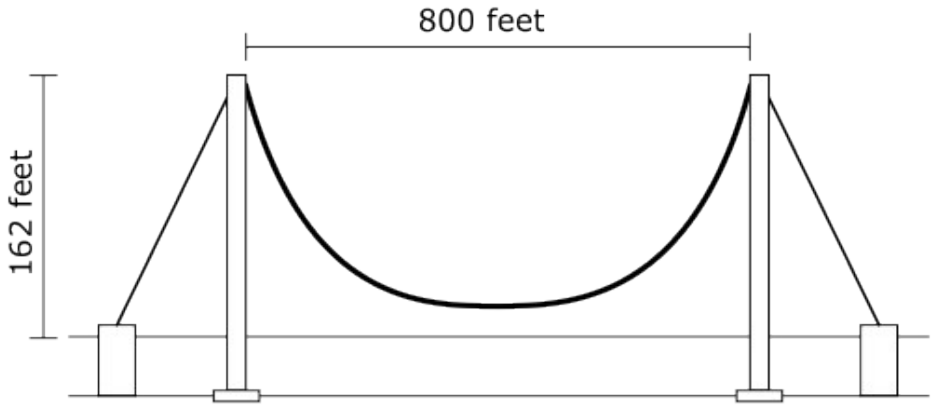
194. **Which of the following quadratic functions has complex roots $x = -2 + 3i$ and $x = -2 - 3i$?**

A. $x^2 + 4x - 5$
B. $x^2 - 4x - 5$
C. $x^2 - 4x + 13$
D. $x^2 + 4x + 13$

195. **A ball is thrown upward from the top of a building that is 160 feet tall. The height, *h*, of the ball *t* seconds after being thrown is given by the equation $h = -16t^2 + 48t + 160$. After how many seconds will the ball hit the ground?**

A. 2
B. 3
C. 5
D. 10

196. The towers of a suspension bridge are 800 feet apart and rise 162 feet higher than the road. Suppose that the cable between the towers has the shape of a parabola and is 2 feet higher than the road at the point halfway between the towers.



What is the ***approximate*** height of the cable 190 feet from either tower?

A. 80 feet
B. 74 feet
C. 22 feet
D. 46 feet

197. **The quadratic formula is used to solve $x^2 - 5x - 2 = 0$. What value should be substituted for *n* in this equation?**

$$x = \frac{5 \pm \sqrt{n}}{2}$$

A. 13
B. 17
C. 18
D. 33

198. **Solve $3x^2 + 7x - 6 = 0$ for *x*.**

A. $x = \frac{2}{3}$ or $x = 3$
B. $x = -\frac{2}{3}$ or $x = 3$
C. $x = \frac{2}{3}$ or $x = -3$
D. $x = -\frac{2}{3}$ or $x = -3$

199. **The first two steps in solving the equation $2x^2 + 5x - 3 = 0$ by completing the square are shown below.**

Step 1: $2x^2 + 5x = 3$
Step 2: $x^2 + \frac{5}{2}x = \frac{3}{2}$
Step 3: ?

Which equation is Step 3 in the solution?

A. $x^2 + \frac{5}{2}x + \frac{5}{2} = \frac{3}{2} + \frac{5}{2}$
B. $x^2 + \frac{5}{2}x + \frac{5}{4} = \frac{3}{2} + \frac{5}{4}$
C. $x^2 + \frac{5}{2}x + \frac{25}{4} = \frac{3}{2} + \frac{25}{4}$
D. $x^2 + \frac{5}{2}x + \frac{25}{16} = \frac{3}{2} + \frac{25}{16}$

200. **What are all values of *x* for which $(2x - 4)(6x - 3) = 0$?**

A. $x = \frac{1}{2}$ only
B. $x = 2$ only
C. $x = \frac{1}{2}$ and $x = 2$ only
D. $x = 0$ and $x = \frac{1}{2}$ and $x = 2$ only

201. **What is the solution set for the following equation?**

$x^2 - 6x + 9 = 16$

A. $\{-7, 1\}$
B. $\{-1, 7\}$
C. $\{3, 4\}$
D. $\{3\}$

202. **What are the roots of the equation** $9x^2 + 3x - 2 = 0$?

A. $\left\{-\frac{2}{3}, -\frac{1}{3}\right\}$
B. $\left\{-\frac{2}{3}, \frac{1}{3}\right\}$
C. $\left\{\frac{2}{3}, -\frac{1}{3}\right\}$
D. $\left\{\frac{2}{3}, \frac{1}{3}\right\}$

203. **What are the solutions to** $0 = x^2 + 10x + 21$?

A. $x = -7$ and $x = -3$
B. $x = -5$ and $x = -2$
C. $x = 10$ and $x = 11$
D. $x = 1$ and $x = 21$

204. **The length in inches of each side of a square is given by the expression *x* + 2. The area of the square can be represented by** $(x + 2)^2 - 16 = 0$ **when the area is 16 square inches. What is the value of *x*?**

A. 2
B. $\sqrt{12}$
C. 4
D. 6

205. **What is the solution set for the equation** $x^2 - 3x - 18 = 0$?

A. $\{-6, -3\}$
B. $\{-6, 3\}$
C. $\{-3, 6\}$
D. $\{3, 6\}$

206. **If the quadratic formula is used to solve $\frac{1}{2}x^2 - x - 3 = 0$, what value should be substituted for *n* in the equation?**

$$x = \frac{1 \pm \sqrt{7}}{n}$$

A. -2
B. $\frac{1}{2}$
C. 1
D. $2\frac{1}{2}$

207. **What is the solution set to the equation $2x^2 - 7x - 15 = 0$?**

A. $\left\{-5, \frac{3}{2}\right\}$
B. $\left\{-3, \frac{5}{2}\right\}$
C. $\left\{3, -\frac{5}{2}\right\}$
D. $\left\{5, -\frac{3}{2}\right\}$

208. **Which statement is true for the equation $2x^2 + 2x + 4 = x^2 + x + 10$?**

A. The equation is true for both positive and negative values of x.
B. The equation is true only for all negative values of x.
C. The equation is true only for positive values of x.
D. The equation is never true.

209. **The area of a square can be represented by the expression $4x^2 - 4x + 1$. If the area of the square is 121 square inches, what is the value of *x*, in inches?**

A. 4
B. 5
C. 6
D. 11

210. **A toy rocket is launched upward from the ground at a rate of 64 feet per second. The function $h(t) = -16t^2 + 64t$ represents *h*, the height of the rocket, at any given time, *t*, in seconds after the launch. How many seconds after launch will the rocket hit the ground?**

A. 2
B. 4
C. 16
D. 48

211. **A ball is thrown upward at a velocity of 15 meters per second from a height that is 20 meters above the ground. The height *h* (in meters) of the ball at time *t* (in seconds) after it is thrown can be found by the formula below.**

$h = -5t^2 + 15t + 20$

Find the time when the ball is again 20 meters above the ground.

A. 1 second
B. 2 seconds
C. 3 seconds
D. 4 seconds

212. **If the quadratic formula is used to solve $\frac{1}{2}x^2 - 3x + 2 = 0$, what value should be substituted for *n* in the equation below?**

$x = \frac{3 \pm \sqrt{5}}{n}$

A. -6
B. $\frac{1}{2}$
C. 1
D. $\frac{5}{2}$

213. **What is the solution set to the equation $x^2 - 4x + 5 = 50$?**

A. $\{-9, -5\}$
B. $\{-9, 5\}$
C. $\{-5, 9\}$
D. $\{5, 9\}$

214. **What is the solution set of the equation $2x^2 - x - 6 = 0$?**

A. $\{-4, 3\}$
B. $\{-3, 4\}$
C. $\left\{-2, \frac{3}{2}\right\}$
D. $\left\{-\frac{3}{2}, 2\right\}$

215. **If the quadratic formula is used to solve $\frac{1}{2}x^2 + 2x - 3 = 0$, what value should be substituted for *n* in the equation below?**

$$x = \frac{-2a \pm \sqrt{10}}{n}$$

A. -4
B. $\frac{1}{2}$
C. 1
D. $\frac{5}{2}$

216. **Which expression represents the solutions for the equation $2z^2 - 6z + 3 = 0$?**

A. $\frac{3 \pm \sqrt{3}}{2}$
B. $\frac{3 \pm 2\sqrt{3}}{2}$
C. $\frac{3 \pm \sqrt{15}}{2}$
D. $\frac{3 \pm 2\sqrt{15}}{2}$

217. **Which equation has roots of -1 and 2?**

A. $(x - 1)(x - 2) = 0$
B. $(x - 1)(x + 2) = 0$
C. $(x + 1)(x - 2) = 0$
D. $(x + 1)(x + 2) = 0$

218. **What values of *x* make the equation $3 - x^2 = 2 - x$ true?**

A. $\frac{1 \pm \sqrt{5}}{-2}$
B. $\frac{1 \pm \sqrt{5}}{2}$
C. $\frac{1 \pm \sqrt{21}}{-2}$
D. $\frac{1 \pm \sqrt{21}}{2}$

219. If the quadratic equation $2x^2 - bx = 8$ has two real solutions, which of these describes the possible values of *b*?

A. $b < -8$ or $b > 8$

B. $b \leq -8$ or $b \geq 8$

C. *b* can be any real number.

D. *b* can have any value that makes $b^2 + 64$ a perfect square.

220. **Which expression represents the proper use of the quadratic formula to solve the equation $x^2 = 6x + 4$?**

A. $\frac{-6 \pm \sqrt{36 - 16}}{2}$

B. $\frac{-6 \pm \sqrt{36 + 16}}{2}$

C. $\frac{6 \pm \sqrt{36 - 16}}{2}$

D. $\frac{6 \pm \sqrt{36 + 16}}{2}$

221. **If** $x^2 = 16$, then $x =$

A. 4 only

B. ± 4

C. 8 only

D. ± 8

222. **Using factoring, what are the solutions to the equation** $2x^2 + 2x - 24 = 0$**?**

A. *x* = –3 or *x* = 4

B. *x* = –1 or *x* = 12

C. *x* = 3 or *x* –4

D. *x* - 1 or *x* = –12

223. **Which quadratic equation has** $\frac{7 \pm \sqrt{37}}{2}$ **as its roots?**

A. $x^2 - 7x + 3 = 0$

B. $x^2 - 7x - 3 = 0$

C. $x^2 + 7x + 3 = 0$

D. $x^2 + 7x - 3 = 0$

224. **A scientist is using the function $P(t) = t^2 + t + 1$ to calculate the number of bacteria present in a specimen after *t* minutes. How many minutes have passed when there are 57 bacteria present in the specimen?**

A. 7
B. 8
C. 14
D. 16

225. **The formula $s = 16t^2$ is used to approximate the distance *s*, in feet, that an object falls freely in *t* seconds. How long will it take a twig hanging 725 ft above the soil to reach soil when it breaks off the tree?**

A. about 2052.1 seconds
B. about 45.3 seconds
C. about 362.5 seconds
D. about 6.7 seconds

226. **Which value of *x* is one solution to the equation $(x + 8)(x - 3) = 0$?**

A. $x = 8$
B. $x = 0$
C. $x = -3$
D. $x = -8$

227. **Which expressions are the solutions to the quadratic equation $8x^2 - 10x = -9$?**

A. $\frac{-5 + \sqrt{97}}{8}$ and $\frac{-5 - \sqrt{97}}{8}$
B. $\frac{5 + \sqrt{97}}{8}$ and $\frac{5 - \sqrt{97}}{8}$
C. $\frac{5 + i\sqrt{47}}{8}$ and $\frac{5 - i\sqrt{47}}{8}$
D. $\frac{5 + i\sqrt{94}}{8}$ and $\frac{5 - i\sqrt{94}}{8}$

228. **Which number is a solution to $x^2 + 8x + 12 = 0$?**

A. -3
B. -2
C. 1
D. 6

229. **A ball is thrown into the air. The function $h = 10t - 5t^2$ can be used to find the height (*h*) of the ball in meters after *t* seconds. How long does it take for the ball to reach a height of 5 meters?**

A. $\frac{1}{5}$ second
B. 1 second
C. 2 seconds
D. 5 seconds

230. **Which function is related to the quadratic equation that has the real number 8 as its only solution?**

A. $f(x) = x^2 - 8$

B. $f(x) = x^2 - 64$

C. $f(x) = x^2 + 16x + 64$

D. $f(x) = x^2 - 16x + 64$

231. **Which of the following numbers is one root of the equation** $x^2 - 6x + 1 = 0$**?**

A. $3 + \sqrt{10}$

B. $3 + 2\sqrt{2}$

C. $-3 + 4\sqrt{2}$

D. $-3 + 2\sqrt{10}$

232. **What is the solution to the quadratic equation** $9x^2 + 30x + 25 = 0$**?**

A. $-\frac{5}{3}$

B. $-\frac{3}{5}$

C. $\frac{3}{5}$

D. $\frac{5}{3}$

233. If the equation $(x+a)^2 = b$ has non-real solutions where *a* and *b* are real numbers, which of these **must** be true?

A. $b - a$ is not a perfect square

B. b is not a perfect square

C. $b - a < 0$

D. $b < 0$

234. **To find the roots of the quadratic equation $3x^2 - 2x + 1 = 0$, Carla correctly applied the quadratic formula. Which of the following is that correct application?**

A. $x = \frac{-2 \pm \sqrt{(-2)^2 - 4(3)(1)}}{2(3)}$

B. $x = \frac{-2 \pm \sqrt{(-2)^2 - 4(-2)(1)}}{2(3)}$

C. $x = \frac{-(-2) \pm \sqrt{(2)^2 - 4(3)(1)}}{2(3)}$

D. $x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(3)(1)}}{2(3)}$

235. **Marcus threw a rock from a bridge. The function $h(t) = -16t^2 + 48t + 64$ gives the height of the rock, in feet, *t* seconds after he threw it. How many seconds did the rock take to reach the water?**

A. 1
B. 4
C. 16
D. 64

236. What are the solutions of the quadratic equation below?

$x^2 - 4x - 6 = 0$

A. $x = 2 \pm \sqrt{2}$

B. $x = -2 \pm \sqrt{2}$

C. $x = 2 \pm \sqrt{10}$

D. $x = -2 \pm \sqrt{10}$

237. **What are the solutions to $\frac{x^2}{44} = \frac{x}{11} - 1$?**

A. $2 + \sqrt{3}$ and $2 - \sqrt{3}$
B. $-2 + 4\sqrt{3}$ and $-2 - 4\sqrt{3}$
C. $2 + 2i\sqrt{10}$ and $2 - 2i\sqrt{10}$
D. $-2 + 4i\sqrt{10}$ and $-2 - 4i\sqrt{10}$

238. An equation in the form $ax^2 + bx + c = 0$ is solved by the quadratic formula. The solution to the equation is shown below.

$$x = \frac{7 \pm \sqrt{61}}{2}$$

What are the values of *a*, *b*, and *c* in the quadratic equation?

A. $a = 1,\ b = -7,\ c = 3$
B. $a = 1,\ b = -7,\ c = -3$
C. $a = 1,\ b = 7,\ c = 3$
D. $a = 1,\ b = 7,\ c = -3$

239. **Which equation shows the first step in the solution of $x^2 + 7x = -8$ by completing the square?**

A. $x^2 + 7x + \frac{49}{4} = -8$
B. $x^2 + 7x + \frac{49}{2} = -8$
C. $x^2 + 7x + \frac{49}{4} = -8 + \frac{49}{4}$
D. $x^2 + 7x + \frac{49}{2} = -8 + \frac{49}{2}$

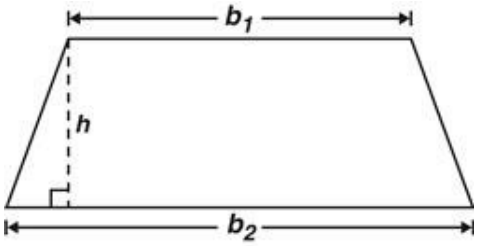
240. **The function below describes *A*, the area of a rectangular garden, in square feet, where *x* represents the values of the length and the width of the garden, in feet.**

$$A(x) = -x^2 + 35x$$

If the area of the garden is 216 square feet, what is the length of the shorter side of the garden?

A. 6 feet
B. 8 feet
C. 27 feet
D. 36 feet

241. **The area of a trapezoid can be found by the formula $A = \frac{1}{2}h(b_1 + b_2)$.**



Note: Figure not drawn to scale

The area of this trapezoid is 15 square inches. If $b_1 = h$ and $b_2 = h + 4$, find the length of *h* in inches.

A. 3
B. 5
C. 7
D. 13

242. What are the solutions to the equation below?

$3x^2 - 2x - 8 = 0$

A. $x = -\frac{4}{3}, x = 2$

B. $x = \frac{4}{3}, x = -2$

C. $x = -\frac{2}{3}, x = 4$

D. $x = \frac{2}{3}, x = -4$

243. **What are the solutions to the quadratic equation below?**

$x^2 - 9x + 20 = 0$

A. $-5, -4$

B. $-5, 4$

C. $5, -4$

D. $5, 4$

244. **What number must be added to both sides of the equation $x^2 - \frac{3}{2}x = 2$ to solve the equation by completing the square?**

A. $\frac{4}{9}$

B. $\frac{9}{16}$

C. $\frac{3}{4}$

D. $\frac{9}{4}$

245. **A ball is thrown in the air. The relationship between the amount of time the ball is in the air in seconds (*t*) and the ball's distance above the ground in feet (*h*) is represented by the equation below.**

$h = -16t^2 + 30t + 4$

How many seconds will it take for the ball to hit the ground?

A. $\frac{1}{8}$

B. $\frac{1}{4}$

C. 2

D. 4

246. **What is the solution for the equation** $x^2 + 5x - 7 = 0$?

A. $\left\{\frac{-5+2\sqrt{7}}{2}, \frac{-5-2\sqrt{7}}{2}\right\}$

B. $\left\{\frac{5+2\sqrt{7}}{2}, \frac{5-2\sqrt{7}}{2}\right\}$

C. $\left\{\frac{-5+\sqrt{53}}{2}, \frac{-5-\sqrt{53}}{2}\right\}$

D. $\left\{\frac{5+\sqrt{53}}{2}, \frac{5-\sqrt{53}}{2}\right\}$

247. **In solving the quadratic equation** $x^2 + 8x - 20 = 0$ **by completing the square, these steps are given.**

Step 1: $x^2 + 8x = 20$
Step 2: $x^2 + 8x + 16 = 20 + 16$

To continue solving the equation by completing the square, what should be Step 3?

A. $x + 4 = 36$

B. $(x-4)^2 = 36$

C. $(x+4)^2 = 36$

D. $(x+4)(x-4) = 36$

248. **Which value of *x* is a solution to the equation** $x^2 - 12x + 36 = 0$?

A. $x = -6$

B. $x = -3$

C. $x = 3$

D. $x = 6$

249. **Which expression shows a correct use of the quadratic formula to solve the equation** $2x^2 = 5x - 1$?

A. $\frac{-5 \pm \sqrt{25-8}}{4}$

B. $\frac{-5 \pm \sqrt{25+8}}{4}$

C. $\frac{5 \pm \sqrt{25-8}}{4}$

D. $\frac{5 \pm \sqrt{25+8}}{4}$

250. **John solved the equation $2x^2 + 3x = 5$ by using the quadratic formula. His work is shown below**

$$x = \frac{n \pm \sqrt{49}}{4}$$

What value should John substitute for *n* found in the equation above?

A. -5

B. -3

C. 3

D. 5