

Algebra 1
Practice Chapter 9 Test

NAME

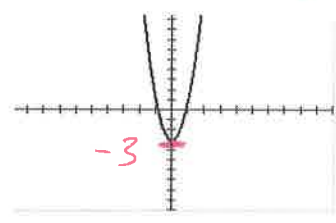
KEY

Write the letter for the best answer. (3 Points each)

1. What is the equation of the axis of symmetry of $y = x^2 + 4x - 9$. $x = \frac{-b}{2a}$
 $x = \frac{-4}{2(1)} = -2$
 A. $x = 4$ **B. $x = -2$** C. $x = -4$ D. $x = 2$

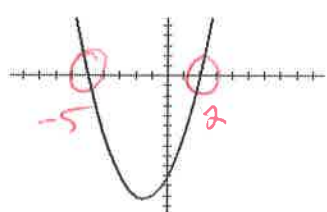
2. Find the coordinates of the vertex of the graph of $y = x^2 - 3$. Identify the vertex as a maximum or a minimum.
 $x = \frac{-b}{2a} = \frac{0}{2(1)} = 0$
 A. (0, -3) max **B. (0, -3) min** C. (-3, 0) max D. (-3, 0) min
 $\begin{array}{r|l} x & y \\ \hline 0 & -3 \end{array}$

3. What equation corresponds to the graph shown?
 A. $-\frac{1}{4}x^2 + 3$ B. $\frac{1}{4}x^2 - 3$
 C. $-4x^2 + 3$ **D. $4x^2 - 3$**



4. Find the coordinates of the vertex of the graph of $y = 3x^2 + 6x - 5$. Identify the vertex as a maximum or a minimum.
 $x = \frac{-b}{2a} = \frac{-6}{2(3)} = -1$
 A. (-1, -8) max **B. (-1, -8) min** C. (1, 4) max D. (1, 4) min

5. What are the root(s) of the quadratic equation whose related function whose graph is shown?
A. 2, -5 B. (2, 0)(-5, 0)
 C. -2, 5 D. \emptyset

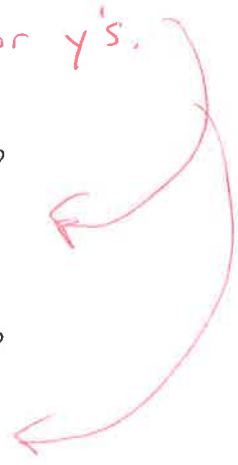


6. What are the root(s) of the quadratic equation $y = x^2 - x + 12$?
 A. (-4, 3) **B. -3, 4**
 C. (-3, -4) D. 3, -4
 Graphing Calculator
 Look for 0 for y's.

7. What are the root(s) of the quadratic equation $y = x^2 - 6x + 9$?
 A. 3, -3 B. -3
C. 3 D. \emptyset

8. What are the root(s) of the quadratic equation $y = x^2 + 6x - 4$?
 A. 1, -6 **B. 0.6, -6.6**
 C. 1.6, 6.6 D. 1.6

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____



9. Without graphing, which is true about the quadratic equation $y = -2x^2 + 8$?

- A. up 8, vert. shrink, reflection **B. up 8, vert. stretch, reflection**
 C. down 8, vert. shrink, reflection D. down 8, vertical stretch, reflection

10. Without graphing, which is true about the quadratic equation $y = \frac{1}{3}x^2 - 4$?

- A. up 4, vert. shrink B. up 4, vert. stretch
C. down 4, vert. shrink D. down 4, vertical stretch

11. Which value of c makes $x^2 - 10x + c$ a perfect square?

- A. 25** B. ~~25~~
 C. 100 D. -100

9. _____

10. _____

12. Which value of c makes $x^2 + 9x + c$ a perfect square?

- A. $\frac{81}{4}$** B. $\frac{81}{2}$
 C. 81 D. 18

11. _____

12. _____

13. Solve $x^2 - 4x + 4 = 9$ by completing the square.

- A. -1, 5** B. 8.2, -4.7
 C. -2, 10 D. 4, -10

$x^2 - 4x = 5$
 $x^2 - 4x + 4 = 5 + 4$
 $(x - 2)^2 = 9$

14. _____

15. _____

14. Solve $x^2 - 6x + 9 = 16$ by completing the square.

- A. $\frac{3}{4}, \frac{9}{4}$ B. 1, -7
 C. $\frac{3}{4}, \frac{9}{4}$ **D. -1, 7**

$x - 2 = 3$ $x - 2 = -3$
 $x^2 - 6x = 7$
 $x^2 - 6x + 9 = 7 + 9$
 $(x - 3)^2 = 16$
 $x - 3 = 4$ $x - 3 = -4$

16. _____

15. Solve $2x^2 + 7x + 11 = 15$ by completing the square.

- A. -4, 0.5** B. 3.3, -11.3
 C. 4, -0.5 D. -3.3, 11.3

$\frac{2x^2 + 7x}{2} = \frac{4}{2}$
 $x^2 + \frac{7}{2}x + \frac{49}{16} = 2 + \frac{49}{16}$
 $(x + \frac{7}{4})^2 = \frac{81}{16}$
 $\frac{2}{16} + \frac{49}{16}$

16. Solve $2x^2 - 5x - 9 = -5$ by completing the square.

- A. 2.6, -14.6 **B. -0.6, 3.2**
 C. 4.8, -12.8 D. 3.7, -14.7

$x + \frac{7}{4} = \frac{9}{4}$ $x + \frac{7}{4} = -\frac{9}{4}$
 $x + \frac{7}{4} = \frac{9}{4}$ $x + \frac{7}{4} = -\frac{16}{4}$
 $x = \frac{1}{2}$ $x = -4$

$2x^2 - 5x = 4$
 $x^2 - \frac{5}{2}x = 2$
 $x^2 - \frac{5}{2}x + \frac{25}{16} = \frac{2}{1} + \frac{25}{16}$
 $(x - \frac{5}{4})^2 = \frac{57}{16}$
 $x - 1.3 = 1.9$ $x - 1.3 = -1.9$

17. Solve $3x^2 - 6x - 27 = 45$ by completing the square.

- A. 9.5, -7.5
- C. 6.3, -4.3

- B. 6, -4**
- D. 9, -12

$$3x^2 - 6x = 72$$

$$x^2 - 2x = 24$$

$$x^2 - 2x + 1 = 24 + 1 \quad x-1=5 \quad x-1=-5$$

$$(x-1)^2 = 25$$

18. Solve $x^2 - 8x - 4 = 0$ by using the Quadratic Formula.

- A. 3.3, -1.3
- C. -0.5, 8.5**

- B. -3.9, 1.9
- D. 4.5, -12.5

$$a=1 \quad b=-8 \quad c=-4$$

$$\frac{8 \pm \sqrt{64 - 4(1)(-4)}}{2(1)}$$

$$\frac{8 \pm \sqrt{80}}{2}$$

$$\frac{8 \pm \sqrt{64+16}}{2}$$

19. Solve $x^2 + 7x - 8 = 0$ by using the Quadratic Formula.

- A. $-\frac{5}{3}, 1$

- B. -8, 1**

- C. $\frac{5}{3}, -1$

- D. 8, -1

$$a=1 \quad b=7 \quad c=-8$$

$$\frac{-7 \pm \sqrt{49 - 4(1)(-8)}}{2(1)}$$

$$\frac{-7 \pm \sqrt{81}}{2}$$

$$\frac{-7 \pm 9}{2}$$

20. Solve $2x^2 - x - 15 = 0$ by using the Quadratic Formula.

- A. -1.2, 5.2
- C. -4.9, 1.9

- B. -4.9, 2.7
- D. -2.5, 3**

$$a=2 \quad b=-1 \quad c=-15$$

$$\frac{1 \pm \sqrt{1 - 4(2)(-15)}}{2(2)}$$

$$\frac{1 \pm \sqrt{1+120}}{4}$$

$$\frac{1 \pm 11}{4}$$

21. Solve $x^2 + 4x + 2 = 0$ by using the Quadratic Formula.

- A. -2.3, 5.3
- C. -1.5, 6.5

- B. -0.6, -3.4**
- D. -5.8, -0.2

$$a=1 \quad b=4 \quad c=2$$

$$\frac{-4 \pm \sqrt{16 - 4(1)(2)}}{2(1)}$$

$$\frac{-4 \pm \sqrt{16-8}}{2}$$

$$\frac{-4 \pm \sqrt{8}}{2}$$

22. Solve $x^2 + 3x - 12 = 0$ by using the Quadratic Formula.

- A. -5.9, 2.9
- C. -2.7, 0.7

- B. 2.3, -5.3**
- D. \emptyset

$$a=1 \quad b=3 \quad c=-12$$

$$\frac{-3 \pm \sqrt{9 - 4(1)(-12)}}{2(1)}$$

$$\frac{-3 \pm \sqrt{9+48}}{2}$$

$$\frac{-3 \pm 7.5}{2}$$

23. Solve $5x^2 + 13x + 5 = 0$ by using the Quadratic Formula.

- A. -0.5, -2.1**
- C. -2.5, 0.2

- B. -1.7, 2.6
- D. \emptyset

$$a=5 \quad b=13 \quad c=5$$

$$\frac{-13 \pm \sqrt{169 - 4(5)(5)}}{2(5)}$$

$$\frac{-13 \pm \sqrt{169-100}}{10}$$

$$\frac{-13 \pm 8.3}{10}$$

24. Solve $5x^2 + 11 = 0$ by using the Quadratic Formula.

- A. -2.9, 0.3
- C. -2.5, 0.6

- B. -4.8, 2.8
- D. \emptyset**

$$a=5 \quad b=0 \quad c=11$$

$$\frac{0 \pm \sqrt{0 - 4(5)(11)}}{2(5)}$$

$$\frac{0 \pm \sqrt{0-220}}{20}$$

$$\frac{0 \pm \sqrt{-220}}{20}$$

Can't have negative

25. Solve $2x^2 + 6x - 17 = 0$ by using the Quadratic Formula.

- A. -4.8, 1.8**
- C. -9.6, 3.6

- B. -4, 1
- D. \emptyset

$$a=2 \quad b=6 \quad c=-17$$

$$\frac{-6 \pm \sqrt{36 - 4(2)(-17)}}{2(2)}$$

$$\frac{-6 \pm \sqrt{36+136}}{4}$$

$$\frac{-6 \pm 13.1}{4}$$

26. Find the value of the discriminant of $x^2 + 5x + 7 = 0$ and determine the number of real solutions.

$b^2 - 4ac$

$25 - 4(1)(7)$

$25 - 28$

-3

- A. 0 real Solutions
- C. 2 real Solutions

- B. 1 real Solution
- D. \emptyset

27. Find the value of the discriminant of $x^2 - 4x - 8 = 0$ and determine the number of real solutions.

$b^2 - 4ac$

$16 - 4(1)(-8)$

$16 + 32$

48

- A. 0 real Solutions
- C. 2 real Solutions

- B. 1 real Solution
- D. \emptyset

26. _____

27. _____

28. _____

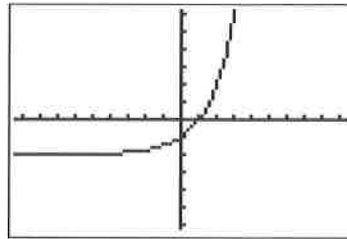
28. Which equation corresponds to the graph?

A. $y = 2^x + 1$

B. $y = 2^x - 1$

C. $y = \left(\frac{1}{2}\right)^x + 1$

D. $y = \left(\frac{1}{2}\right)^x - 1$



29. _____

30. _____

31. _____

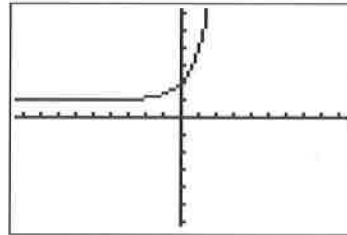
29. Which equation corresponds to the graph?

A. $y = 3^x + 2$

B. $y = 3^x - 2$

C. $y = \left(\frac{1}{3}\right)^x + 2$

D. $y = \left(\frac{1}{3}\right)^x - 2$



30. Look for the pattern in the table to determine which model best describes the data.

x	-1	0	1	2	3	4
y	7	11	17	25	35	47

A. linear

B. quadratic

C. exponential

D. none of these

Handwritten notes: 1st Diff: 4, 6, 8, 10, 12; 2nd Diff: 2, 2, 2, 2. ← 1st Diff, ← 2nd Diff is the same

31. Look for the pattern in the table to determine which model best describes the data.

x	-1	0	1	2	3	4
y	13	18	23	28	33	38

A. linear

B. quadratic

C. exponential

D. none of these

Handwritten notes: 5, 5, 5, 5, 5 ← 1st Diff is the same