Student: _____	**Instructor:** Dawn Nolan	**Assignment:** Optional Chapter 9
Date: _____	**Course:** Algebra 1 Honors	PRACTICE Test

1. Graph the parabola. Identify the vertex.

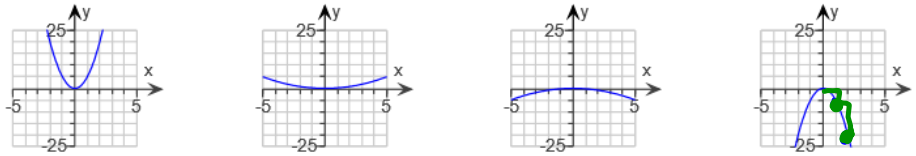
$y = -5x^2$

x	y
1	-5
2	-20

$-5 \cdot 1 = -5$
$-5 \cdot 3 = -15$
$-5 \cdot 5 = -25$
$-5 \cdot 2^2 = -5 \cdot 4$

Choose the correct graph below.

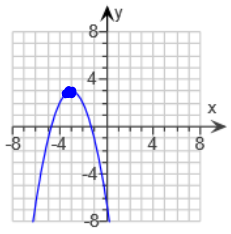
○ A. ○ B. ○ C. ● D.



What is the vertex?

(0,0) (Type an ordered pair.)

2. Identify the vertex of the graph. Tell whether it is a minimum or a maximum.



v: (-3, 3)

max

What is the vertex of the graph?

(-3,3) (Type an ordered pair.)

Is the vertex a minimum or a maximum?

● Maximum
○ Minimum

$y = a(x-h)^2 + k$

$v: (h, k)$

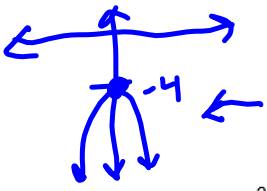
3. Identify the domain and range of the function.

$f(x) = -2x^2 - 4$

$v: (0, -4)$

What is the domain of the function $f(x) = -2x^2 - 4$?

- ○ $x > 0$
- ○ $x > 4$
- ○ $x \le 0$
- ○ $x \le 4$
- ○ $x \ge -4$
- ○ $x < 0$
- ○ $x < -4$
- ● All real numbers



$y \le -4$

What is the range of the function $f(x) = -2x^2 - 4$?

- ○ All real numbers
- ○ $y \le 4$
- ○ $y \ge 4$
- ● $y \le -4$
- ○ $y > -4$
- ○ $y < 4$
- ○ $y < -4$
- ○ $y \ge -4$

4. Graph the function.

$y = 4x^2 - 1$

Choose the correct graph on the right.

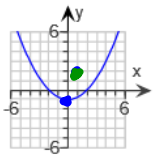
$v: (0, -1)$

x	y
1	3

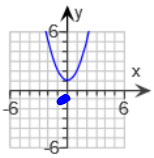
$4(1)^2 - 1$
$4 - 1$
3

$4 \cdot 1 = 4$
$4 \cdot 3 = 12$
~~$4 \cdot 5 = 20$~~

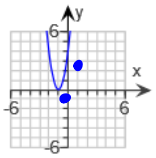
○ A.



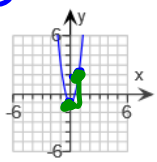
○ B.



○ C.



● D



$2 \cdot 1^2 + 4 \cdot 1 + 7$
$2 + 4 + 7 = 13$

$a = 2$
$b = 4$
$c = 7$

5. Graph the function.

$y = 2x^2 + 4x + 7$

Use the graphing tool to graph the parabola.

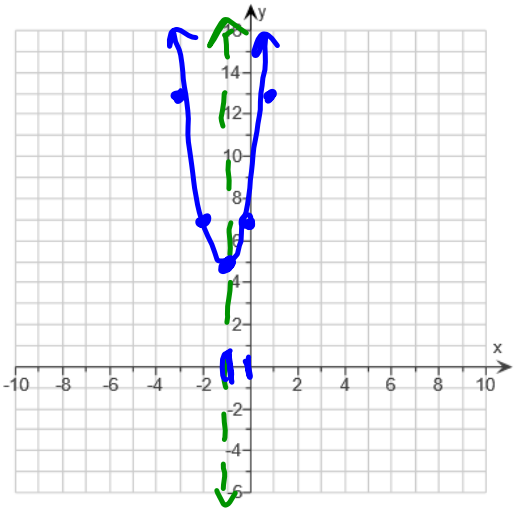
$\frac{-b}{2a} = \frac{-4}{2(2)} = -1$

$2 \cdot 1 = 2$
$2 \cdot 3 = 6$
$2 \cdot 5$

AOS: $x = -1$ V: $(-1, 5)$

x	y
-1	5
0	7
1	

$2(-1)^2 + 4(-1) + 7$
$2 - 4 + 7$
$-2 + 7$
5



6. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the following function.

$a = -4$ $b = -16$

$y = -4x^2 - 16x - 13$

$\frac{-b}{2a} = \frac{16}{2(-4)} = -2$

$y = -4(-2)^2 - 16(-2) - 13$
$-16 + 32 - 13$
$16 - 13$
3

The axis of symmtery is $x =$ -2. (Simplify your answer.)

The vertex is $(-2, 3)$. (Type an ordered pair. Simplify your answer.)

7. Graph the function. Identify the axis of symmetry and the vertex.

$a = 1$
$b = -2$

$f(x) = x^2 - 2x + 11$

$\frac{-b}{2a} = \frac{2}{2 \cdot 1} = 1$

The axis of symmetry is $x = 1$.
(Type an equation.)

The vertex is $(1, 10)$.
(Type an ordered pair.)

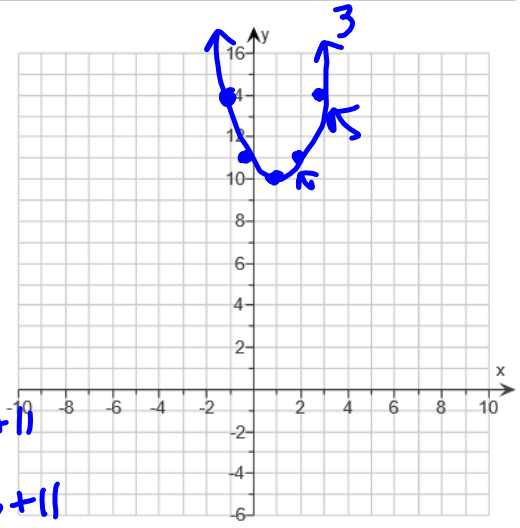
$1 \cdot 1 = 1$
$1 \cdot 3 = 3$
$1 \cdot 5 = 5$

Use the graphing tool to graph the parabola.

$y = 1^2 - 2 \cdot 1 + 11$
$1 - 2 + 11$
$-1 + 11$
10

x	y
2	11
3	14

$4 - 4 + 11$
$9 - 6 + 11$



8. Solve the equation by finding square roots.

$x^2 - 16 = 0$

$x^2 - 16 = 0$, $+16 \; +16$, $\sqrt{x^2} = \sqrt{16}$, $x = \pm 4$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $x =$ 4, −4 (Simplify your answer. Use a comma to separate answers as needed.)

B. The solution is not a real number.

9. Solve the equation by finding square roots.

$3x^2 - 12 = 0$

$3x^2 - 12 = 0$, $+12 \; +12$, $\frac{3x^2}{3} = \frac{12}{3}$, $\sqrt{x^2} = \sqrt{4}$, $x = \pm 2$

Solve the equation for x. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $x =$ 2, −2 (Simplify your answer. Use a comma to separate answers as needed.)

B. There are no real solutions.

10. Solve.

$(x - 5)(5x + 6) = 0$

$x - 5 = 0$, $x = 5$; $5x + 6 = 0$, $-6 \; -6$, $\frac{5x}{5} = \frac{-6}{5}$, $x = -\frac{6}{5}$

The solution is $x =$ 5, $-\frac{6}{5}$.

(Use a comma to separate answers as needed.)

11. Solve by factoring.

$w^2 + 6w + 8 = 0$

8: 1·8, 2·4

$(x+2)(x+4) = 0$

$x + 2 = 0$, $x = -2$; $x + 4 = 0$, $x = 4$

The solution is $w =$ _____.

(Use a comma to separate answers as needed.)

12. Solve by factoring.

$2w^2 - 13w = 7$, $-7 \; -7$

$2w^2 - 13w - 7 = 0$

$2w^2 + 1w - 14w - 7 = 0$

−14: −1·14, 2·−7

Select the correct choice and fill in any answer boxes in your choice below.

$w(2w+1) - 7(2w+1) = 0$

$(w-7)(2w+1) = 0$

A. $w =$ 7, $-\frac{1}{2}$

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

B. The solution is not a real number.

13. Solve. Factor by grouping.

$x^3 + 3x^2 - 25x - 75 = 0$

$w - 7 = 0$, $w = 7$; $2w + 1 = 0$, $-1 \; -1$, $\frac{2w}{2} = \frac{-1}{2}$, $w = -\frac{1}{2}$

The solution set is {−3, −3, 5}. (Use a comma to separate answers as needed.)

$x^3 + 3x^2 - 25x - 75 = 0$

$x^2 \; x^2 \; -25 \; -25$

$x^2(x+3) - 25(x+3) = 0$

$(x^2 - 25)(x+3) = 0$

$x^2 - 25 = 0$, $+25 \; +25$, $\sqrt{x^2} = \sqrt{25}$, $x = \pm 5$

$x + 3 = 0$, $x = -3$

14. Find the value of c such that the expression is a perfect-square trinomial.

$x^2 + 6x + c$

$c =$ _____

(Simplify your answer. Type an integer or a fraction.)

15. Solve the equation by completing the square.

$a^2 - 10a - 56 = 0$

$a =$ _____

(Simplify your answer. Type an integer or decimal rounded to the nearest hundredth as needed. Use a comma to separate answers as needed.)

16. Find the vertex of the parabola by completing the square.

$y = x^2 + 10x - 27$

The vertex is _____ (Type an ordered pair.)

17. Use the quadratic formula to solve the equation.

$-5x^2 - 19x + 4 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $x =$ _____

(Use a comma to separate answers as needed.)

B. The solution is not a real number.

18. Use the quadratic formula to solve the equation.

$5x^2 + 22x - 9 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $x =$ _____

(Round to the nearest hundredth as needed. Use a comma to separate answers as needed.)

B. The solution is not a real number.

19. Which method would you choose to solve the equation? Justify your reasoning.

$4x^2 - 36 = 0$

Choose the best method and reason.

- **A.** square roots because there is no x-term
- **B.** graphing because the equation is written with zero on one side of the equals sign
- **C.** quadratic formula because the equation cannot be factored
- **D.** factoring because the quadratic formula cannot be used

20. Find the number of real-number solutions of the equation below.

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

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

$4-4^*(1)(2)$

$4-8=\boxed{-4}$

b^2-4ac

\+ 2 real sol.

0 1 real sol.

− 0 real sol.

Choose the correct answer below.

- **A.** The equation has no real-number solution.
- **B.** The equation has one real-number solution.
- **C.** The equation has two real-number solutions.

21. Which type of function best models the data set?

$(-1,3), (0,2), (2,1.125), (3,0.75)$

x	y	1st	2nd
	3		
+1		−1	
	2		0.125
+1		−0.875	
	1.125		0.5
+1		−0.375	
	0.75		

$\frac{0.75}{1.125} = \frac{1.125}{2} = \frac{1}{3}$

0.667 0.5625 0.667

sol

0 1 2

D: − 0 +

linear: 1st diff x

quadratic: 2nd diff x

exponential: common ratio

Choose the correct answer below.

- None
- Linear model
- Exponential model
- Quadratic model

22. Which type of function best models the data in the table? Use differences or ratios.

x	y
0	0
1	7.5
2	30
3	67.5
4	120

Choose the correct answer below.

- Exponential model
- Quadratic model
- None
- Linear model

23. Solve the system by the substitution method.

$$\begin{cases} x + y = 3 \\ y = x^2 - 8x + 15 \end{cases}$$

$x+(x^2-8x+15)=3$

$x^2-7x+15=3$

$-3\quad -3$

$x^2-7x+12=0$

12

$-3:4$

$(x-3)(x-4)=0$ $x=3$ $x=4$

$x-3=0$ $x-4=0$

$x=3$

$3+y=3$

$-3\quad -3$

$y=0$

$x=4$

$4+y=3$

$-4\quad -4$

$y=-1$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

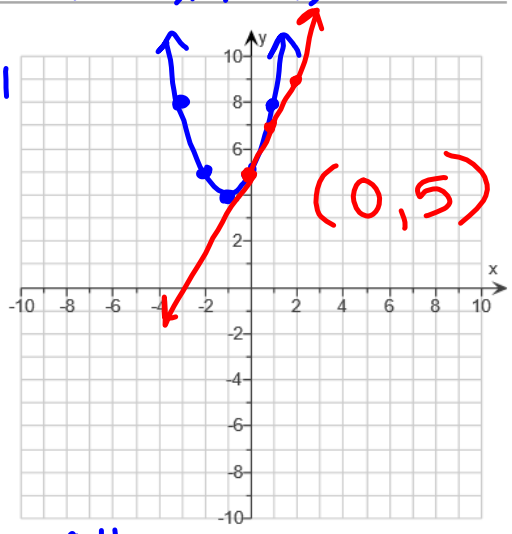
A. The solution(s) is/are $(3,0)$ $(4,-1)$
(Type an ordered pair. Use a comma to separate answers if needed.)

B. There are no solutions.

24. Solve the following system by graphing.

$$\begin{cases} y = x^2 + 2x + 5 \\ y = 2x + 5 \end{cases}$$

$\frac{-b}{2a} = \frac{-2}{1 \cdot 1} = -1$



Use the graphing tool to graph the system.

The solution(s) is/are _____.
(Type an ordered pair. Use a comma to separate answers as needed.)

$y=(-1)^2+2(-1)+5$

$1-2+5$

$-1+5$

4

$V:(-1,4)$

$1 \cdot 1 = 1$

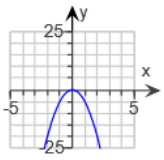
$1 \cdot 3 = 3$

$1 \cdot 5 = 5$

x	y
0	5
1	8

$1+2+5=8$

1.



D.

(0,0)

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2. (− 3,3)

Maximum

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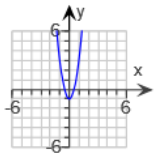
3. All real numbers

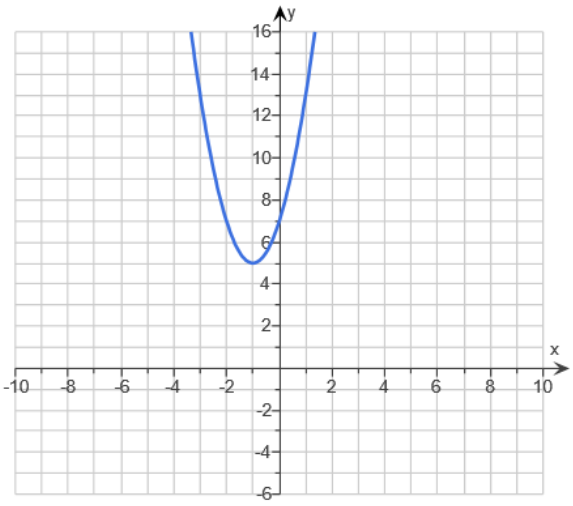
$y \leq -4$

4.



D.

5.



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6. − 2

(− 2,3)

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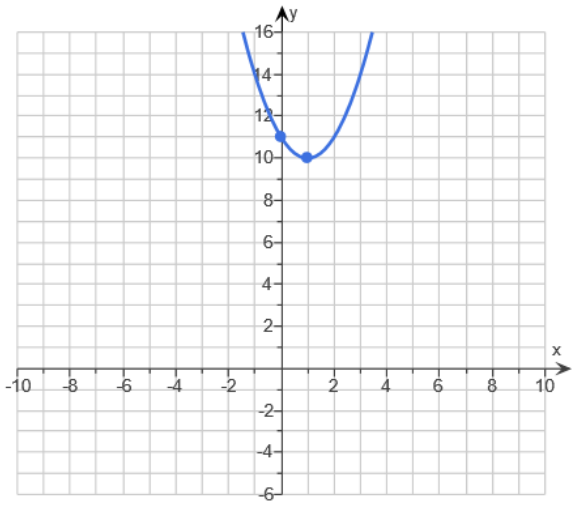
7. $x = 1$

(1,10)



8. A. $x =$ **−4,4** (Simplify your answer. Use a comma to separate answers as needed.)

9. A. $x =$ **2, −2** (Simplify your answer. Use a comma to separate answers as needed.)

10. $5, -\frac{6}{5}$

11. $-2, -4$

12. A. $w =$ $-\frac{1}{2}, 7$

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

13. $-5, -3,5$

14. 9

15. $14, -4$

16. $(-5, -52)$

17. A. $x = -4, \frac{1}{5}$ (Use a comma to separate answers as needed.)

18. A. $x =$ **0.38, − 4.78**
(Round to the nearest hundredth as needed. Use a comma to separate answers as needed.)

19. A. square roots because there is no x-term

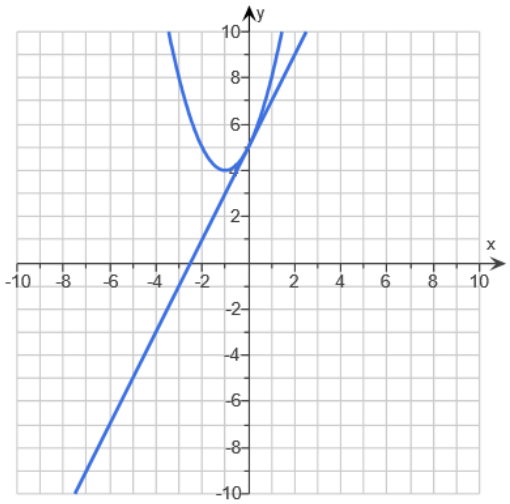
20. A. The equation has no real-number solution.

21. Exponential model

22. Quadratic model

23. A. The solution(s) is/are **(3,0),(4, − 1)** .
(Type an ordered pair. Use a comma to separate answers if needed.)

24.



(0,5)