

# Chapter 9 Test Review Packet

Name: KEY

## Section 9.1: Square Roots

Evaluate the following expression.

1.)  $-\sqrt{100}$

$$\boxed{-10}$$

2.)  $\pm\sqrt{64}$

$$\boxed{\pm 8}$$

3.)  $\sqrt{25}$

$$\boxed{5}$$

4.)  $\sqrt{b^2 - 4ac}$  when  $a = 3, b = 8,$  and  $c = 4$

$$\sqrt{(8)^2 - 4(3)(4)}$$

$$\sqrt{64 - 48}$$

$$\sqrt{16}$$

$$\boxed{4}$$

## Section 9.2: Solving Quadratic Equations by Finding Square Roots

Solve the following equations. Write your answer in simplest radical form.

5.)  $\frac{2x^2}{2} = \frac{162}{2}$

$$x^2 = 81$$

$$\sqrt{x^2} = \sqrt{81}$$

$$\boxed{x = \pm 9}$$

6.)  $x^2 - 4 = 4$   
 $+4 +4$

$$x^2 = 8$$

$$\sqrt{x^2} = \sqrt{8}$$

$$\sqrt{4} \sqrt{2}$$

$$\boxed{x = \pm 2\sqrt{2}}$$

7.)  $4x^2 + 2 = 26$   
 $-2 -2$

$$\frac{4x^2}{4} = \frac{24}{4}$$

$$x^2 = 6$$

$$\sqrt{x^2} = \sqrt{6}$$

$$\boxed{x = \pm \sqrt{6}}$$

## Section 9.3: Simplifying Radicals

Simplify the following expressions.

8.)  $\sqrt{45}$

$$\sqrt{9} \sqrt{5}$$

$$\boxed{3\sqrt{5}}$$

9.)  $\sqrt{192}$

$$\sqrt{64} \sqrt{3}$$

$$\boxed{8\sqrt{3}}$$

10.)  $2\sqrt{32}$

$$\sqrt{16} \sqrt{2}$$

$$2 \cdot 4 \sqrt{2}$$

$$\boxed{8\sqrt{2}}$$

Simplify the following expressions.

$$11.) \sqrt{\frac{4}{36}}$$

$$\frac{\sqrt{4}}{\sqrt{36}}$$

$$\frac{2}{6}$$

$$\boxed{\frac{1}{3}}$$

$$12.) \sqrt{\frac{15 \div 5}{20 \div 5}}$$

$$\sqrt{\frac{3}{4}}$$

$$\frac{\sqrt{3}}{\sqrt{4}}$$

$$\boxed{\frac{\sqrt{3}}{2}}$$

$$13.) 3\sqrt{\frac{1}{3}}$$

$$3\frac{\sqrt{1}}{\sqrt{3}}$$

$$3\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$$

$$3\frac{\sqrt{3}}{19}$$

$$3\frac{\sqrt{3}}{3}$$

$$\boxed{\sqrt{3}}$$

Section 9.4: Graphing Quadratic Functions

Graph the function by completing the table. Identify the graph's axis of symmetry (AOS), vertex, and tell whether the graph opens up or down.

$$14.) y = -x^2 - 2x + 3$$

a    b    c

AOS:  $x = -1$

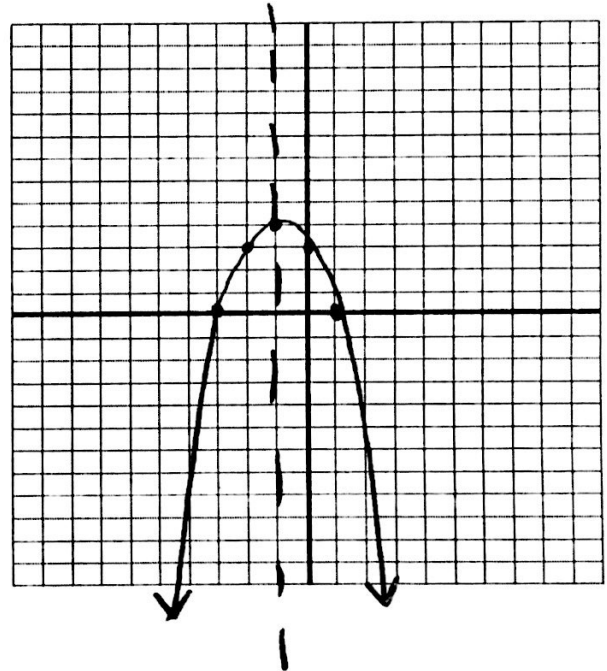
vertex:  $(-1, 4)$

y-int:  $(0, 3)$

opens: down

x	-3	-2	-1	0	1
y	0	3	4	3	0

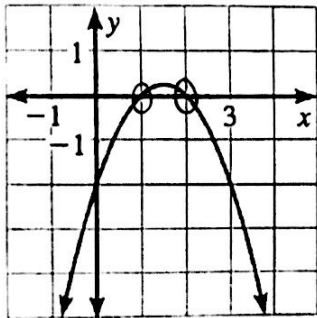
$$x = \frac{-b}{2a} = \frac{-(-2)}{2(-1)} = \frac{2}{-2} = -1$$



Section 9.5: Solving Quadratic Equations by Graphing

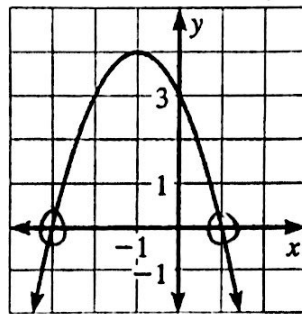
Use the graph to identify the solutions.

15.)



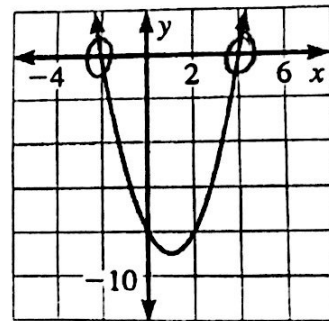
1, 2

16.)



-3, 1

17.)



-2, 4

Solve the quadratic equations by graphing. Identify the graph's axis of symmetry (AOS), vertex, solutions, and tell whether the graph opens up or down.

18.)  $y = 3x^2$   
 $a$

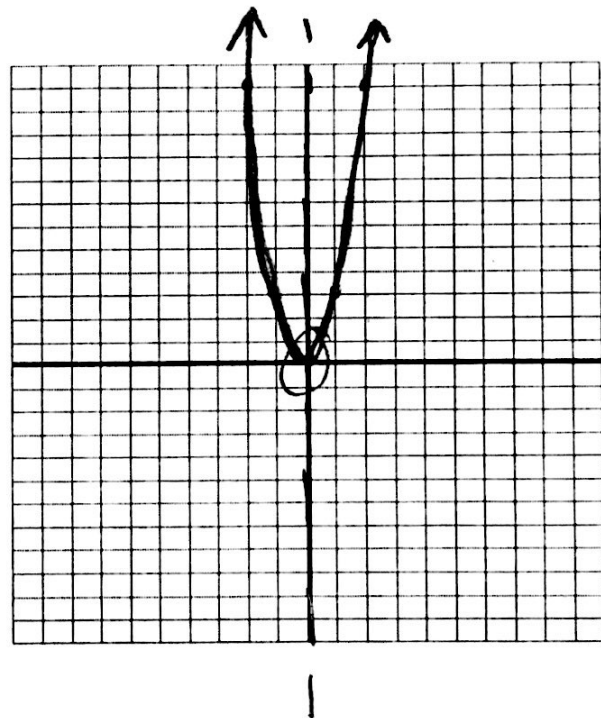
AOS:  $x = 0$

vertex:  $(0, 0)$

y-int:  $(0, 0)$

opens: UP

solution/s: 0



x	-2	-1	0	1	2
y	12	3	0	3	12

$$x = \frac{-b}{2a} = \frac{-(0)}{2(3)} = \frac{0}{6} = 0$$

$$19.) y = x^2 - 2x - 3$$

$a$ 
 $b$ 
 $c$

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

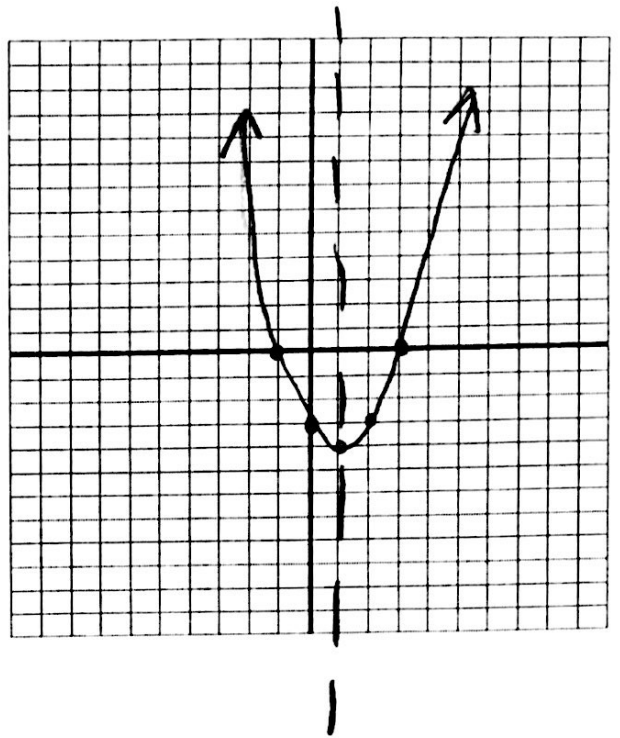
AOS:  $X = 1$

vertex:  $(1, -4)$

y-int:  $(0, -3)$

opens: UP

solution/s:  $-1, 3$



x	-1	0	1	2	3
y	0	-3	-4	-3	0

**Section 9.6: Solving Quadratic Equations by the Quadratic Formula**

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve the quadratic equations using the quadratic formula. Write your answer in simplest radical form.

20.)  $3x^2 - 4x - 1 = 0$

$a$ 
 $b$ 
 $c$

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

$$X = \frac{4 \pm \sqrt{16 + 12}}{6}$$

$$X = \frac{4 \pm \sqrt{28}}{6} < \frac{\sqrt{4}}{\sqrt{7}}$$

$$X = \frac{4 \pm 2\sqrt{7}}{6}$$

$$X = \frac{2 \pm \sqrt{7}}{3}$$

21.)  $-x^2 + 3x - 2 = 0$

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

$$X = \frac{-3 \pm \sqrt{9 - 8}}{-2}$$

$$X = \frac{-3 \pm \sqrt{1}}{-2}$$

$$X = \frac{-3 \pm 1}{-2}$$

$$X = \frac{-3+1}{-2}$$

$$X = \frac{-2}{-2}$$

$$X = 1$$

$$X = \frac{-3-1}{-2}$$

$$X = \frac{-4}{-2}$$

$$X = 2$$

22.)  $x^2 - 2x = 8$

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

$$X = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(-8)}}{2(1)}$$

$$X = \frac{2 \pm \sqrt{4 + 32}}{2}$$

$$X = \frac{2 \pm \sqrt{36}}{2}$$

$$X = \frac{2 \pm 6}{2}$$

$$X = \frac{2+6}{2}$$

$$X = \frac{8}{2}$$

$$X = 4$$

$$X = \frac{2-6}{2}$$

$$X = \frac{-4}{2}$$

$$X = -2$$

Section 9.7: Using the Discriminant

Find the value of the discriminant. Then use the value to determine whether the equation has two solutions, one solution, or no real solution.

23.)  $x^2 + 3 = 0$

$(0)^2 - 4(1)(3)$

$0 - 12$

$-12$

no real solution

24.)  $x^2 - 4x + 4 = 0$

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

$16 - 16$

$0$

one solution

25.)  $-x^2 - 10x - 25 = 0$

$(-10)^2 - 4(-1)(-25)$

$100 - 100$

$0$

one solution

Section 9.8: Graphing Quadratic Inequalities

Graph the following quadratic inequalities.

26.)  $y \geq x^2$  (solid)

$y = x^2$

$x = \frac{-b}{2a} = \frac{-(0)}{2(1)} = 0$

AOS:  $x = 0$

vertex:  $(0, 0)$

y-int:  $(0, 0)$

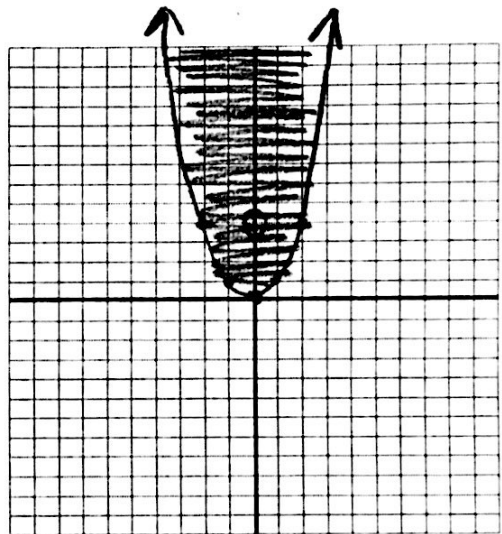
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Test:  $(0, 3)$

$3 \geq (0)^2$

$3 \geq 0 \checkmark$

x	-2	-1	0	1	2
y	4	1	0	1	4



27.)  $y < x^2 + 2x + 2$  (dashed)

$y = x^2 + 2x + 2$

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

AOS:  $x = -1$

vertex:  $(-1, 1)$

y-int:  $(0, 2)$

opens: UP

Test:  $(0, 0)$

$0 < (0)^2 + 2(0) + 2$

$0 < 2 \checkmark$

x	-3	-2	-1	0	1
y	5	2	1	2	5

