Name: **KEY**   Hour: _____   Date: _____

NOTES: Section 9.1-9.6 REVIEW

Goals: #1 - I can evaluate and approximate square roots.

     #2 - I can solve a quadratic equation by finding square roots.

     #3 - I can simplify radical expressions.

     #4 - I can graph a quadratic function.

     #5 - I can use a graph to find or check a solution of a quadratic equation.

     #6 - I can use the quadratic formula to solve a quadratic equation.

Section 9.1: *Square Roots*

Evaluate the following expression.

1. $-\sqrt{49}$

$$\boxed{-7}$$

2. $\pm\sqrt{81}$

$$\boxed{\pm 9}$$

3. $\sqrt{100}$

$$\boxed{10}$$

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

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

1. $x^2 = 25$

$$\sqrt{x^2} = \sqrt{25}$$

$$\boxed{x = \pm 5}$$

2. $3x^2 = 108$

$$\frac{3}{3} \quad \frac{108}{3}$$

$$x^2 = 36$$

$$\sqrt{x^2} = \sqrt{36}$$

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

3. $-4x^2 - 5 = 59$

$$+5 \quad +5$$

$$\frac{-4x^2}{-4} = \frac{64}{-4}$$

$$x^2 = -16$$

$$\sqrt{x^2} = \sqrt{\cancel{-16}}$$

$$\boxed{\text{no real solution}}$$

Section 9.3: Simplifying Radicals

Simplify the following expressions.

1. $\sqrt{54}$

$\sqrt{9} \quad \sqrt{6}$

$\boxed{3\sqrt{6}}$

2. $\sqrt{75}$

$\sqrt{25} \quad \sqrt{3}$

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

3. $2\sqrt{32}$

$2 \cdot \sqrt{16} \quad \sqrt{2}$

$2 \cdot 4\sqrt{2}$

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

4. $\sqrt{\dfrac{9}{64}}$

$\dfrac{\sqrt{9}}{\sqrt{64}}$

$\boxed{\dfrac{3}{8}}$

5. $\sqrt{\dfrac{2}{3}}$

$\dfrac{\sqrt{2}}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}}$

$\dfrac{\sqrt{6}}{\sqrt{9}}$

$\boxed{\dfrac{\sqrt{6}}{3}}$

6. $3\sqrt{\dfrac{15}{20}}$

$3\dfrac{\sqrt{15}}{\sqrt{20}} \cdot \dfrac{\sqrt{20}}{\sqrt{20}}$

$3\dfrac{\sqrt{300}}{\sqrt{400}}$

$3\dfrac{\sqrt{100} \cdot \sqrt{3}}{20}$

$3 \cdot \dfrac{10 \cdot \sqrt{3}}{20}$

$\dfrac{30\sqrt{3}}{20}$

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

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.

1. $y = x^2 - 4x - 3$

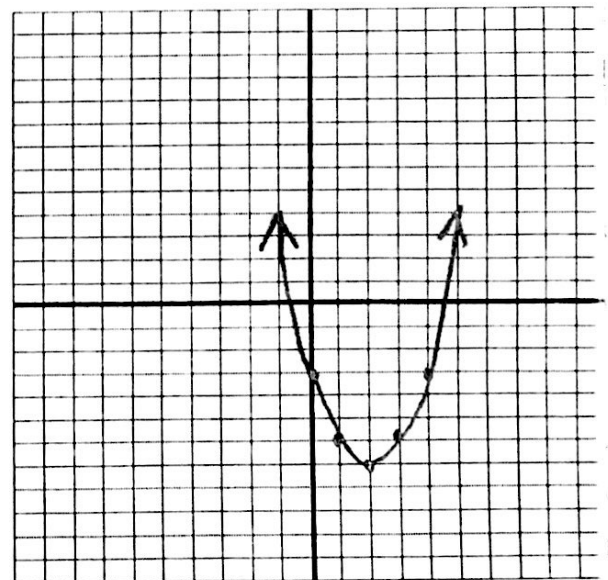$X = \dfrac{-b}{2a} = \dfrac{-(-4)}{2(1)} = \dfrac{4}{2} = 2$

AOS: $X = 2$

vertex: $(2, -7)$

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

opens: UP

x	0	1	2	3	4
y	-3	-6	-7	-6	-3

Section 9.5: *Solving Quadratic Equations by Graphing*

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.

1. $y = -x^2 + 4$

$$X = \frac{-b}{2a} = \frac{-(0)}{2(-1)} = 0$$
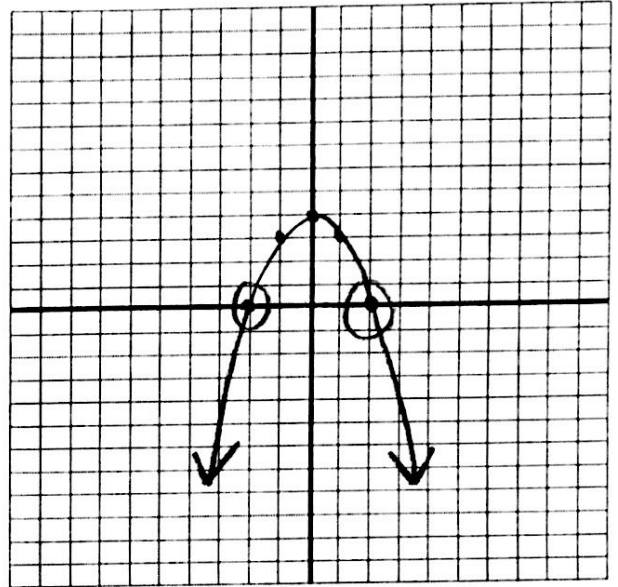
AOS: $X = 0$

vertex: $(0, 4)$

y-int: $(0, 4)$

opens: down

solution/s: $-2, 2$

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

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

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

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

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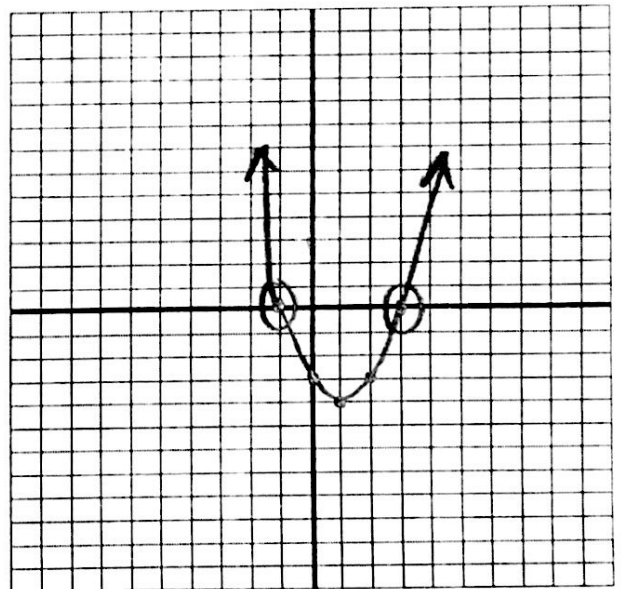
Section 9.6: Solving Quadratic Equations by the Quadratic Formula

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

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

$a = -1$
$b = 3$
$c = -2$

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

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

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

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

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

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

$$X = \frac{-3-1}{-2} = \frac{-4}{-2} = \boxed{2}$$

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

$a = 1$
$b = -2$
$c = -8$

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

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

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

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

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

$$X = \frac{2+6}{2} = \frac{8}{2} = \boxed{4}$$

$$X = \frac{2-6}{2} = \frac{-4}{2} = \boxed{-2}$$

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