10.1-10.4 Quiz  
Study Guide Answer Key

10.1: Graph \( y = ax^2 + c \):

- Be able to graph a quadratic using a table and compare it to the parent function.

**Graph the following quadratic equations by making a table.** **Compare the graph to the parent function.**

**Ex:** \( y = x^2 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

This is the parent quadratic function.

**Ex:** \( y = -2x^2 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>-8</td>
<td>-2</td>
<td>0</td>
<td>-2</td>
<td>-8</td>
</tr>
</tbody>
</table>

Narrower, has a maximum.

**Ex:** \( y = \frac{1}{3}x^2 - 2 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>-6</th>
<th>-3</th>
<th>0</th>
<th>3</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>10</td>
<td>1</td>
<td>-2</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

Wider, has a minimum the vertex is down 2.

- Be able to identify characteristics of quadratic equations based on \( a \) and \( c \) changing and sketch the resulting parabola.

**Sketch the parent function, then sketch the following parabolas based on the equation.**

**Ex:** \( y = 3x^2 + 5 \)

**Ex:** \( y = -x^2 - 4 \)

**Ex:** \( y = -\frac{2}{3}x^2 + 6 \)
10.2: Graph \( y = ax^2 + bx + c \):

- Be able to find the axis of symmetry and vertex of a parabola.

Find the axis of symmetry and vertex of each quadratic equation.

**Ex:** \( y = 2x^2 - 8x + 6 \)  
Axis of symm: \( x = 2 \)  
Vertex (2, –2)

**Ex:** \( y = -3x^2 + 24x - 22 \)  
Axis of symm: \( x = 4 \)  
Vertex: (4, 26)

- Be able to tell if a quadratic equation has a maximum or minimum value, then find the max. or min.

Tell whether the function has a **minimum** or **maximum** value. Then find the min. or max. value.

**Ex:** \( f(x) = -3x^2 + 12x - 20 \)  
Maximum value of –8

**Ex:** \( f(x) = 4x^2 + 32x \)  
Minimum value of –64

- Be able to graph a quadratic function in the form \( y = ax^2 + bx + c \) by finding the axis of symmetry and vertex and making a symmetrical table about the axis.

Graph the quadratic function.

**Ex:** \( y = x^2 + 6x + 2 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>–6</th>
<th>–5</th>
<th>–4</th>
<th>–3</th>
<th>–2</th>
<th>–1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>2</td>
<td>–3</td>
<td>–6</td>
<td>–7</td>
<td>–6</td>
<td>–3</td>
<td>2</td>
</tr>
</tbody>
</table>

**Ex:** \( y = -4x^2 + 4x + 8 \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>–1</th>
<th>0</th>
<th>½</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>0</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>
10.3: Solve Quadratic Equations by Graphing:

- Be able to solve an equation by graphing.

Solve the following quadratic equations by graphing.

Ex: $x^2 - 5x + 4 = 0$

Ex: $2x^2 + x = 3$

$x = 4$ and $x = 1$

$x = 1$ and $x = -1.5$

Ex: $\frac{1}{2}x^2 + 2x = 6$

Ex: $x^2 - 5x + 7 = 0$

$x = 2$ and $x = -6$

no solution

- Be able to approximate zeros of a function to the nearest tenth by making a table.

Approximate the zeros of the function to the nearest tenth.

Ex: $f(x) = x^2 + 4x - 5$

Ex: $f(x) = -3x^2 + 8x - 2$
10.4: Use Square Roots to Solve Quadratic Equations:

- Be able to solve a quadratic equation using square roots

Solve the following quadratic equations.

Ex: \( 4x^2 - 400 = 0 \)

\[ x = \pm 10 \]

Ex: \( 3z^2 - 18 = -18 \)

\[ z = 0 \]

Ex: \( 3x^2 - 35 = 45 - 2x^2 \)

\[ x = \pm 4 \]

Ex: \( 11 \left( \frac{w - 7}{2} \right)^2 - 20 = 101 \)

\[ w = 13.63 \text{ and } w = 0.37 \]