1. Using your notes, write the general form of each equation below.

   **Standard Form:** \( y = ax^2 + bx + c \)
   
   **Intercept Form:** \( y = a(x-p)(x-q) \)
   
   **Vertex Form:** \( y = a(x-h)^2 + k \)

2. In the table below, list the formula needed to find the vertex. Or for vertex form, explain how you would identify the vertex.

<table>
<thead>
<tr>
<th>Standard Form</th>
<th>Intercept Form</th>
<th>Vertex Form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vertex formula:</strong></td>
<td><strong>Vertex formula:</strong></td>
<td><strong>Vertex formula:</strong></td>
</tr>
<tr>
<td>( x = \frac{-b}{2a} )</td>
<td>( p + q )</td>
<td>( y = a(x-h)^2 + k )</td>
</tr>
<tr>
<td></td>
<td>( h )</td>
<td>( V = (h,k) )</td>
</tr>
</tbody>
</table>

3. Find the maximum/minimum of \( y = -x^2 - 4x + 1 \).
   - \( x = -\frac{b}{2a} = \frac{4}{2(-1)} = -2 \)
   - \( y = -(-2)^2 - 4(-2) + 1 = 5 \)
   - \( (-2, 5) \)

4. Find the vertex of \( y = (x-1)(x-3) \).
   - \( x = \frac{p+q}{2} = \frac{1+3}{2} = 2 \)
   - \( y = 2-1)(2-3) = -1 \)
   - \( (2, -1) \)

5. Find the vertex of \( y = -(x-1)^2 \).

6. Find the x-intercepts of \( y = x^2 + 7x - 18 \).
   - \( y = (x+9)(x-2) \)
   - \( x = -9 \)
   - \( (2, 0) \)

7. If a parabola is given by the equation \( f(x) = x^2 + 4x - 7 \), what would change (if anything) if the equation was changed to \( f(x) = x^2 + 2x - 7 \)? Multiple Choice - Circle all that apply.

   A) the y-intercept
   B) the axis of symmetry
   C) the shape of the parabola
   D) the direction the parabola opens
   E) the vertex

8. Describe how the graph of the following function is related to the graph of \( f(x) = x^2 \). Then state the vertex.

   These are four separate questions – it is not multiple choice.

   A) \( y = (x+4)^2 - 7 \)
   - Left 4
   - Down 7
   - \( V(-4, -7) \)

   B) \( y = -\frac{1}{2}x^2 - 5 \)
   - Compressed vertically (wider)
   - Reflected over x-axis
   - Down 5
   - \( V(0, -5) \)

   C) \( y = 3x^2 \)
   - Stretched vertically (narrower)
   - \( V(0, 0) \)

   D) \( y = -6(x-1)^2 + 3 \)
   - Reflected over x-axis
   - Stretched vertically (narrower)
   - Right 1
   - Up 3
   - \( V(1, 3) \)
9) Use a table of values to sketch a graph of \( y = -x^2 + 4x - 2 \). State the vertex, axis of symmetry, domain, and range and \( y \)-intercept.

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td>-2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>-2</td>
</tr>
</tbody>
</table>

Vertex: \((2, 2)\)  
Axis of Symmetry: \( x = 2 \)  
Domain: \( \mathbb{R} \)  
Range: \( y \leq 2 \)  
\( y \)-intercept: \( (0, -2) \)

10) Sketch a graph of \( y = (x + 6)(x + 2) \). State the vertex, \( x \)-intercepts, domain, range, and axis of symmetry.

Vertex: \((-4, -4)\)  
\( x \)-intercepts: \((-6, 0), (-2, 0)\)  
Domain: \( \mathbb{R} \)  
Range: \( y \geq -4 \)  
Axis of Symmetry: \( x = -4 \)

11) Sketch a graph of \( y = (x + 1)^2 + 4 \). State the vertex, axis of symmetry, domain, and range.

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>8</td>
</tr>
<tr>
<td>-2</td>
<td>5</td>
</tr>
<tr>
<td>-1</td>
<td>4</td>
</tr>
<tr>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
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