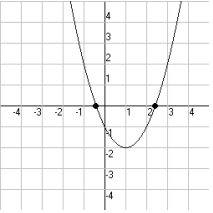
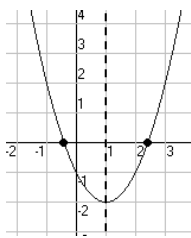
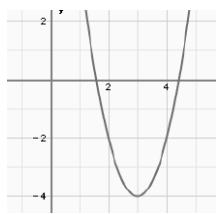
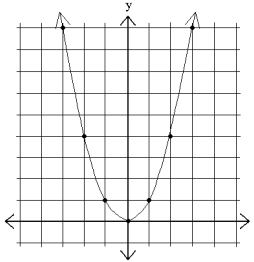
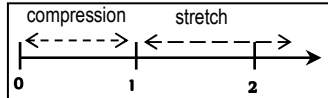


UNIT 1 SURVIVAL GUIDE: Quadratic Relations in Vertex Form

<p><b>RECOGNIZING A QUADRATIC RELATION</b></p> <ul style="list-style-type: none"> <li>quadratic equations are degree _____ eg. <math>y = -2x^2 + 8</math></li> <li>quadratics have _____ second differences</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 10%;">x</th> <th style="width: 40%;">-x<sup>2</sup> - 3</th> <th style="width: 10%;">y</th> <th style="width: 10%;">1<sup>st</sup></th> <th style="width: 10%;">2<sup>nd</sup></th> </tr> </thead> <tbody> <tr><td>0</td><td></td><td></td><td></td><td></td></tr> <tr><td>1</td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td></tr> </tbody> </table> <ul style="list-style-type: none"> <li>quadratics are _____</li> </ul> 	x	-x <sup>2</sup> - 3	y	1 <sup>st</sup>	2 <sup>nd</sup>	0					1					2					3					4					<p><b>THE KEY FEATURES OF A QUADRATIC RELATION</b></p> <ul style="list-style-type: none"> <li>_____ are x-intercepts</li> <li>the _____ occurs where the parabola crosses the y-axis</li> <li>the _____ is the highest/lowest point on a parabola</li> <li>the _____ is an imaginary symmetrical line through the vertex (written as _____)</li> <li>_____ is the highest/lowest y-coordinate on the parabola and can be a _____ or _____</li> </ul> 	<p><b>VERTEX FORM</b></p> <ul style="list-style-type: none"> <li>generalization: _____</li> <li>vertex is _____</li> <li>axis of symmetry is _____</li> <li>optimal value is _____; to determine max/min, see the sign of _____</li> <li>to state an equation in vertex form (given a graph):             <ul style="list-style-type: none"> <li>start with <math>y = a(x - h)^2 + k</math></li> <li>sub the _____ in for <math>h</math> and <math>k</math></li> <li>use the _____ to determine the value of <math>a</math> and sub it in</li> <li>simplify if possible</li> </ul> </li> </ul> <p>eg.</p>  <p style="text-align: right;"><math>y = a(x - h)^2 + k</math></p>
x	-x <sup>2</sup> - 3	y	1 <sup>st</sup>	2 <sup>nd</sup>																												
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4																																
<p><b>THE BASIC PARABOLA</b></p> <ul style="list-style-type: none"> <li>_____</li> <li>all key features occur at the _____</li> <li>the optimal value is a _____</li> <li>use the _____ to graph (right 1 - up 1, right 1 - up 3, right 1 - up 5 and so on)</li> </ul> 	<p><b>TRANSFORMATIONS</b></p> <ul style="list-style-type: none"> <li>sign of 'a' describes _____ (direction of opening and optimal value → _____)</li> <li>value of 'a' describes _____ (narrower) or _____ (wider)</li> </ul> <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">  </div> <ul style="list-style-type: none"> <li>'h' describes the _____ (remove <math>h</math> from bracket first)</li> <li>'k' describes the _____</li> </ul> <p>eg. A parabola is reflected, stretched by 5 and vertically translated down 3.</p> <p>a = _____ k = _____</p> <p style="text-align: center;"><math>y = a(x - h)^2 + k</math></p>	<p><b>UNDERSTANDING PROBLEMS RELATED TO VERTEX FORM</b></p> <ul style="list-style-type: none"> <li>draw sketches to help visualize the situation</li> <li>consider how key features relate to the context of the problem:             <ul style="list-style-type: none"> <li>initial point = _____</li> <li>break-even points = _____</li> <li>max/min profit/distance/height/etc. = _____</li> <li>point at which max/min occurs = _____</li> </ul> </li> </ul>																														