

**Algebra 2**  
**Unit: Trigonometric Functions**  
**Section: Graphing Trigonometric Functions**

**Example: Graphing Transformations of Trigonometric Functions**

**Problem**

Graph the function  $y$  is equal to two cosine of theta plus one.

**Solution**

First graph the function  $y$  is equal to cosine of theta.

Next graph two cosine of theta. Two is the amplitude of the function. This graph crosses the x-axis in the same places, but is twice as tall as the first graph. It goes through the points  $(0, 2)$ ,  $(90, 0)$ ,  $(180, -2)$ ,  $(270, 0)$  and  $(360, 2)$ . This cycle repeats both to the left and the right.

Finally, graph the transformed function  $y$  is equal to two cosine of theta plus one. The function has a vertical shift of one unit up. The entire curve is shifted up one unit, going through the points  $(0, 3)$ ,  $(90, 1)$ ,  $(180, -1)$ ,  $(270, 1)$  and  $(360, 3)$ . This cycle repeats both to the left and the right.