1. [10 points] Be sure to show your work on this problem. Parts \(\text{a.}\) and \(\text{b.}\) are not related.

   \(\text{a.}\) [4 points] Solve for the exact value(s) of \(w\) in the equation
   \[
   \log(1 - w) - \log(1 + w) = 1.
   \]

   If there are no solutions, write “no solutions” in the blank and explain your answer.

   \(w = \)____________________.

   \(\text{b.}\) [6 points] Write the quadratic function \(y = -2x^2 + 16x - 1\) in vertex form by completing the square, write the \(x\) and \(y\) coordinates of the vertex, and indicate whether the vertex is a minimum, maximum or neither by circling the appropriate option.

   In vertex form, \(Q(x) = \)______________.

   The vertex is \((x, y) = \)______________.

   The vertex is a: maximum minimum neither