1. [10 points] Be sure to show your work on this problem. Parts **a.** and **b.** are not related.

    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.

$$w = \underline{\hspace{3cm}}.$$

    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, $Q(x) = \underline{\hspace{4cm}}.$

The vertex is $(x, y) = \underline{\hspace{4cm}}.$

The vertex is a:

        maximum   minimum   neither