Q2: Heaps **Total: 8 points**

For this question, match the question with one of the answers given in the "Options" list. Please fill in your answers electronically using the space provided, save as pdf with the file name "**HW4-Q2_Heaps.pdf"** and submit in the respective Gradescope submission.

A complete binary tree of N elements uses array positions 1 to N. Suppose we try to use an array representation of a binary tree that is not complete. Determine how large the array (in terms of N, last 3 answers are in terms of big-Oh) must be for the following (fill in the answers in the right column below)

A binary tree that has two extra levels (that is, it is slightly unbalanced)	$4N$
A binary tree that has a deepest node at depth 2 logN	N^2
A binary tree that has a deepest node at depth 4.1 log N	$N^{4.1}$
The worst-case binary tree	2^N

Options: N, $N^{1.5}$, N^2, $N^{4.1}$, 4N, $N^{2.5}$, 2^N, $N^{0.5}$, 4^N