Implementing a (min)Heap as an Array

Heap Operation: removeMin / heapifyDown:

Heap Operation: insert / heapifyUp

Q: How do we construct a heap given data?

Ideas
1)
2)
3)
Running Time?
Theorem: The running time of buildHeap on array of size $n$ is: 
__________.

Strategy:

Define $S(h)$:
Let $S(h)$ denote the sum of the heights of all nodes in a complete tree of height $h$.

$S(0) =$
$S(1) =$
$S(h) =$

Proof of $S(h)$ by Induction:

Finally, finding the running time:

<table>
<thead>
<tr>
<th>CS 225 – Things To Be Doing:</th>
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</thead>
<tbody>
<tr>
<td>1. mp_traversals out EC due Monday after break.</td>
</tr>
<tr>
<td>2. lab_huffman is out tomorrow, due Monday after break.</td>
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<tr>
<td>3. final project groups due today!</td>
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<tr>
<td>4. Daily POTDs are ongoing :)</td>
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