11. By definition of ternary tree, it is easy to see that maximum number of nodes at height h is 3^h.

proof: Base case, when tree is empty, # nodes $= 0$

$h = -1$. $\frac{3^{h+1} - 1}{2} = \frac{1-1}{2} = 0$

$\frac{3^{h+1} - 1}{2}$ is max. # of nodes in ternary tree with height $= -1$.

Induction: Suppose, at height k, the max. # of nodes is $\frac{3^{k+1} - 1}{2}$, $k \geq -1$.

Let $h = k+1$, as we already known, # of nodes at $h = k+1$ is 3^{k+1}.

$\therefore$ # of nodes in tree with $h = k+1$ is

$$\frac{3^{k+1} - 1}{2} + 3^{k+1} = \frac{3^{k+1} - 1 + 2 \cdot 3^{k+1}}{2} = \frac{3^{k+2} - 1}{2}$$

$$= \frac{3^{(k+1)+1} - 1}{2}.$$

for $k \geq -1$

Therefore the statement is true.