H.W. 1

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a) The height of the recursion tree is n at LoD n, because SnowFlake-Edge decrements n once for each recursive call it makes.
b) The number of nodes corresponds to the number of edges at a given level. At each level of recursion, each edge splits into 4 edges. Since we start with 3 edges, there are $3 \cdot 4^i$ nodes.
c) There's only 1 triangle at each node, so the asymptotic rendering time is $\Theta(1)$.
d)At each level of the recursion tree, the number of triangles is equal to the number of edges from the last step, so it's $\Theta(numtriangles) = \Theta(numedges) = \Theta(4^i)$
e) Since rendering triangles of arbitrary size all takes the same amount of time, the total asymptotic cost is jut the total number of triangles, which is $\Theta(4^n)$.
f) The height of the recursion tree is still n.
g) The number of nodes is still $3 \cdot 4^i$.
h) The line segments aren't rendered til the end, so the asymptotic rendering time is 0. i) $\Theta(1)$, since there is 1 line rendered for each node.
j) Nodes aren't rendered til the last level, so 0. k) The number of line segments that need to be rendered is a constant times the nnumber of nodes. The number of nodes is 3×4^n, so the asymptotic rendering time is $\Theta(4^n)$.
l) It's the cost of rendering the last level, which is $\Theta(4^n)$.
m) The height of the recursion tree is still n.
n) The number of nodes at a level is still $r \times 4^i$.
o) It's 0 because nodes are only rendered at the last level. p) Rasterizing a line segment takes resources proportional to the length of the line. At each level, the line segment lengths get divided by 3. Thus, it is $\theta((1/3)^n)$.
q) It's 0 since the lines aren't rasterized til the last level.
r)We have to multiply the number of nodes by the length of the segments, which results is $3 \times 4^n \times (1/3)^n = \Theta((4/3)^n)$
s)It's $\Theta((4/3)^n)$