a) $\sum_{i=0}^{n-1} n \cdot i = n \left(\sum_{i=0}^{n-1} i \right)$ = arithmetic series $= n\left(\frac{n(n+1)}{2}\right) = \boxed{\Theta(n^3)}$

b) n^2 → ① satisfies condition (only for one iteration) n times → enter loop (in loop) runs $\log n$

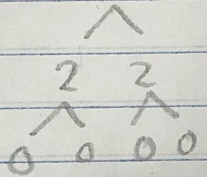
→ ② Doesn't satisfy condition runs $\Theta(1)$

① $n \log n$ + ② $1 \cdot n^2$

$= n \log n + n^2$

$= \boxed{\Theta(n^2)}$

c) $\frac{n}{2}+1$ layers ex:



$\sum_{i=0}^{\frac{n}{2}+1} 2^i = \boxed{\Theta(2^{\frac{n}{2}})}$

d) $\sum_{i=0}^{\log_{\frac{3}{2}} n} 10 \cdot \left(\frac{3}{2}\right)^i = 10 \sum_{i=0}^{\log_{\frac{3}{2}} n} \left(\frac{3}{2}\right)^i$ geometric series $\frac{a(1-n^i)}{1-n}$

$= \frac{10\left(1 - \frac{3}{2}^{\log_{\frac{3}{2}} n}\right)}{1 - \frac{3}{2}}$

$= -20(1-n)$

$= \boxed{\Theta(n)}$