

Homework 3: Induction & Recursion

11. Θ -estimate for $f(n) = 15f(n/4) + 6n^2$

a. Apply the Master Theorem

- i. $a = 15, b = 4, d = 2$
- ii. $a < b^d$, since $15 < 4^2 = 16$
- iii. Therefore, $f(n) = \Theta(n^2)$

12. Θ -estimate for $3g(n/9) + 6n^{1/2}$

a. Apply the Master Theorem

- i. $a = 3, b = 9, d = 1/2$
- ii. $a = b^d$, since $3 = 9^{1/2} = 3$
- iii. Therefore, $g(n) = \Theta(n^{1/2} \log n)$