

$$3) T(N) = T\left(\frac{N}{4}\right) + n^3$$

$$a=1, b=4 \quad f(n) = n^3$$

$$n^{\log_4 1} = n$$

Look at case 3

$$f\left(\frac{n}{4}\right) \leq c f(n) \quad \text{for } c < 1 \text{ and large } n$$

$$\text{Let } c = \frac{1}{64}$$

$$f\left(\frac{n}{4}\right) = \frac{n^3}{64} \leq c n^3$$

$$\frac{n^3}{64} \leq c n^3 \quad \text{Let } c =$$

$$\frac{1}{64} \leq c$$

$$\text{Let } c = \frac{1}{2}$$

Therefore

$$T(n) = \Theta(n^3)$$