# **Examples**

**Ex.** $T(n) = 4T(n/2) + n^3$
$a = 4$, $b = 2 \Rightarrow n^{\log_b a} = n^2$; $f(n) = n^3$.
 **CASE 3**: $f(n) = \Omega(n^{2 + \varepsilon})$ for $\varepsilon = 1$
**and** $4(n/2)^3 \leq cn^3$ (reg. cond.) for $c = 1/2$.
$\therefore\ T(n) = \Theta(n^3)$.

**Ex.** $T(n) = 4T(n/2) + n^2/\lg n$
$a = 4$, $b = 2 \Rightarrow n^{\log_b a} = n^2$; $f(n) = n^2/\lg n$.
Master method does not apply. In particular,
for every constant $\varepsilon > 0$, we have $n^\varepsilon = \omega(\lg n)$.