

7) a) Divide  $N$   
Conquer  $3n^2$   
Combine  $n$

$$\begin{aligned} b) T(n) &= 9T(n/3) + \theta(n^2) \\ &= 9 \cdot [9T(n/9) + \theta(n^2/9)] + \theta(n^2) \\ &= 3^4 T(n/3^4) + 9\theta(n^2/3^4) + \theta(n^2) \\ &= 3^{2n} T(n/3^n) + 3^n (n/3)^n + \theta(n)^2 \\ &= \theta(3^{2n}) \end{aligned}$$

Best guess, OVT  
of time 4 min left

c) Divide & conquer is better  
in the text Strassens Algorithm  
is described as being  
 $O(n^{2.81})$

vs

Brute force  $O(n^3)$