Duke Glenn Assignment 2

1a) $W(n) = 2W(n/3) + 1$

$= O(n^{\log_3 2})$

1b) $W(n) = 5W(n/4) + n$

$= O(n^{\log_4 5})$

1c) $W(n) = 7W(n/7) + n$

$= O(n \log_7 n)$

1d) $W(n) = 9W(n/3) + n^2$

$= O(n^2 \log_3 n)$

1e) $W(n) = 8W(n/2) + n^3$

$= O(n^3 \log_2 n)$

1f) $W(n) = 49W(n/25) + n^{3/2} \log n$

$= O(n^{3/2} \log n)$

1g) $W(n) = W(n-1) + 2$

$= O(n)$

1h) $W(n) = W(n-1) + n^c, \quad c \geq 1$

$= O(n^{c+1})$

1i) $W(n) = W(\sqrt{n}) + 1$

$= O(\log(\log n))$

2) A: $W(n) = 5W(n/2) + n = O(n^{\log_2 5})$

B: $2W(n/2) + 1 = O(n^2)$

C: $W(n) = 9W(n/3) + O(n^2) = O(n^2 \log_3 n)$

I would choose C because its the fastest