Q1

a) The highest power in $5n^3 + 2n^2 + 3n$ is n^3 therefore $O(n)$ is $O(n^3)$
b) since $\Omega(n) = \sqrt{7n^2 + 2n - 8} \geq \sqrt{7n^2} =$
and $O(n) = \sqrt{7n^2 + 2n - 8} = O(3n) = O(n)$
$\Omega(n) \leq \Theta(n) \leq O(n)$
therefore $f(n) = \Theta(n)$
c) $d(n)e(n) = O(f(n)g(n))$

Q2

1. Outer loop would run n iterations and inner loop would run n times thus run time would be $\Theta(n^2)$
2. Since the loop runs only one time $\Theta(n^2)$
3. Loop runs till n^2 but loop doubles every time therefore time is $\log(n^2)$
   - $\therefore \Theta(\log(n))$
4. Outer Loop reduces by half but inner loop increases $\therefore \Theta(n)$