b) $n^2 \log n = \Theta(n^2)$. Suppose, it is true. $\therefore$ There exists +ve constants c_1, c_2, n_0 s.t.

$\boxed{c_1 n^2 \leq n^2 \log n \leq c_2 n^2, \text{ for } n \geq n_0}$ $n^2 \log n \leq c_2 n^2 \Rightarrow \log n \leq c_2 \Rightarrow \boxed{n \leq 2^{c_2}}$

There is no upper bound on n. $\therefore$ Contradiction.

c) $\frac{n^2}{\log n} = \Theta(n^2)$. Suppose it is true. $\therefore$ There exists +ve constants c_1, c_2, n_0 s.t.

$\boxed{c_1 n^2 \leq n^2/\log n \leq c_2 n^2, \text{ for } n \geq n_0}$ $c_1 n^2 \leq \frac{n^2}{\log n} \Rightarrow \log n \leq \frac{1}{c_1}$ $\Rightarrow \boxed{n \leq 2^{1/c_1}}$

There is no upper bound on n. $\therefore$ Contradiction

d) $n^3 \cdot 2^n + 6n^2 3^n = O(n^2 \cdot 2^n)$. Suppose it is true. $\therefore$ There exists +ve constants c, n_0 s.t. $\boxed{n^3 2^n + 6n^2 3^n \leq c n^2 2^n \text{ for } n \geq n_0}$

$6n^2 3^n \leq n^2 2^n (c-n) \Rightarrow 6 \cdot 3^n \leq 2^n (c-n) \Rightarrow \boxed{6 \times (1.5)^n + n \leq c}$

If $n \to \infty$, $6(1.5)^n + n \to \infty$ $\therefore$ Contradiction

e) $3^n = O(2^n)$. Suppose it is true. $\therefore$ There exists +ve constants c, n_0 s.t.

$\boxed{3^n \leq c \cdot 2^n}$ for $n \geq n_0$. $\therefore \left(\frac{3}{2}\right)^n \leq c \Rightarrow (1.5)^n \leq c$

As $n \to \infty$, $(1.5)^n \to \infty$ $\boxed{\therefore \text{ Contradiction}}$

5)

Statement	Asymptotic Analysis
`void printMatrix(int matrix[][MAX_SIZE], int rows, int cols)`	$\Theta(1)$
`{`	$\Theta(1)$
`int i,j;`	$\Theta(1)$
`for(i=0; i<rows; i++)`	$\Theta(rows)$
`{`	$\Theta(1)$
`for(j=0; j<cols; j++)`	$\Theta(rows \cdot cols)$
`printf("%d", matrix[i][j]);`	$\Theta(rows \cdot cols)$
`Printf("\n");`	$\Theta(rows)$
`}`	$\Theta(1)$
`}`	$\Theta(1)$

Total: $\Theta(rows \cdot cols)$