P86.

11. $\frac{|P_{n+1}-P|}{|P_n-P|^3}=q$ If $|P_0-P|=0.5$.

then, $|P_n-P|=q|P_{n-1}-P|^3=q[q|P_{n-2}-P|^3]^3=\cdots=q^{\frac{3^n-1}{2}}|P_0-P|^{3^n}$

if $|P_n-P|\le 10^{-8}$ then $n\ge 3$.

P357

8. INPUT: number of unknowns and equations n; augmented matrix $A=[a_{ij}]$, where $1\le i\le n$ and $1\le j\le n+1$.

OUTPUT: solution $x_1, x_2, \cdots x_n$ or message that the linear system has no unique solution.

Step 1 For $i=1,\cdots,n$ do Step 2-4.

Step 2. Let p be the smallest integer with $i\le p\le n$ and $a_{pi}\neq 0$
If no p can be found, OUTPUT ("Not exists")

Step 3 If $p\neq i$ then perform $(E_p)\leftrightarrow(E_i)$

Step 4 For ~~$j=i+1,\cdots,n$~~ $j=1,\cdots,i-1,i+1,\cdots,n$ do Step 5 and 6.

Step 5 Set $m_{ji}=a_{ji}/a_{ii}$.

Step 6 Perform $(E_j-m_{ji}E_i)\to(E_j)$

Step 7. If $a_{nn}=0$ then OUTPUT ("Not exists").

Step 8 ~~For $i=n-1,\cdots,1$, do step 9.~~

Step 9. $E_i-E_{i+1}(a_{j,i}/a_{i+1,i})\to E_j$.

Step 10 Set $x_n=a_{n,n+1}/a_{nn}$.

Step 11 For $i=n-1,\cdots,1$, set $x_i=a_{i,n+1}/a_{ii}$

Step 12 OUTPUT $(x_1, \cdots, x_n)$.

Stop.

P358

11. a. the number of i th row of multiplication is $(n-i+1)(n-1)$.

division: $(n-1)$

$\therefore A = \sum_{i=1}^{n} [(n-1) + (n-i+1)(n-1)] = \frac{n^3}{2} + n^2 - \frac{n}{2}$.

$B = \sum_{i=1}^{n} (n-i+1)(n-1) = \frac{n^3}{2} - \frac{n}{2}$

b.

	Gaussian		Gauss-Jordan	
n	M/D	A/S	M/D	A/S
3	17	11	21	12
10	430	375	595	495
50	44150	42875	64975	62475
100	343300	338250	509950	499950

Gaussian Elimination requires less computation.