Beginning code for HW 5, problem 2

- First look at subroutine itself… comments and declaration part show us what to do…

```
implicit none
INTEGER, PARAMETER :: nmax=20 ! dimension of H matrix, arrays
INTEGER, PARAMETER :: nbin=1000 ! number of discrete slices for plotting
REAL*8, PARAMETER :: L=10.0d0 ! "Length" of the system
REAL*8 :: pi,fac ! pi, fac is used to compute V_m,n in my code
REAL*8 , dimension(nmax) :: fv1,fv2 ! work arrays used by rs
```

Input H matrix

Output

…

```
call rs(nmax,nmax,hamil,w,z,fv1,fv2,ierr)
```

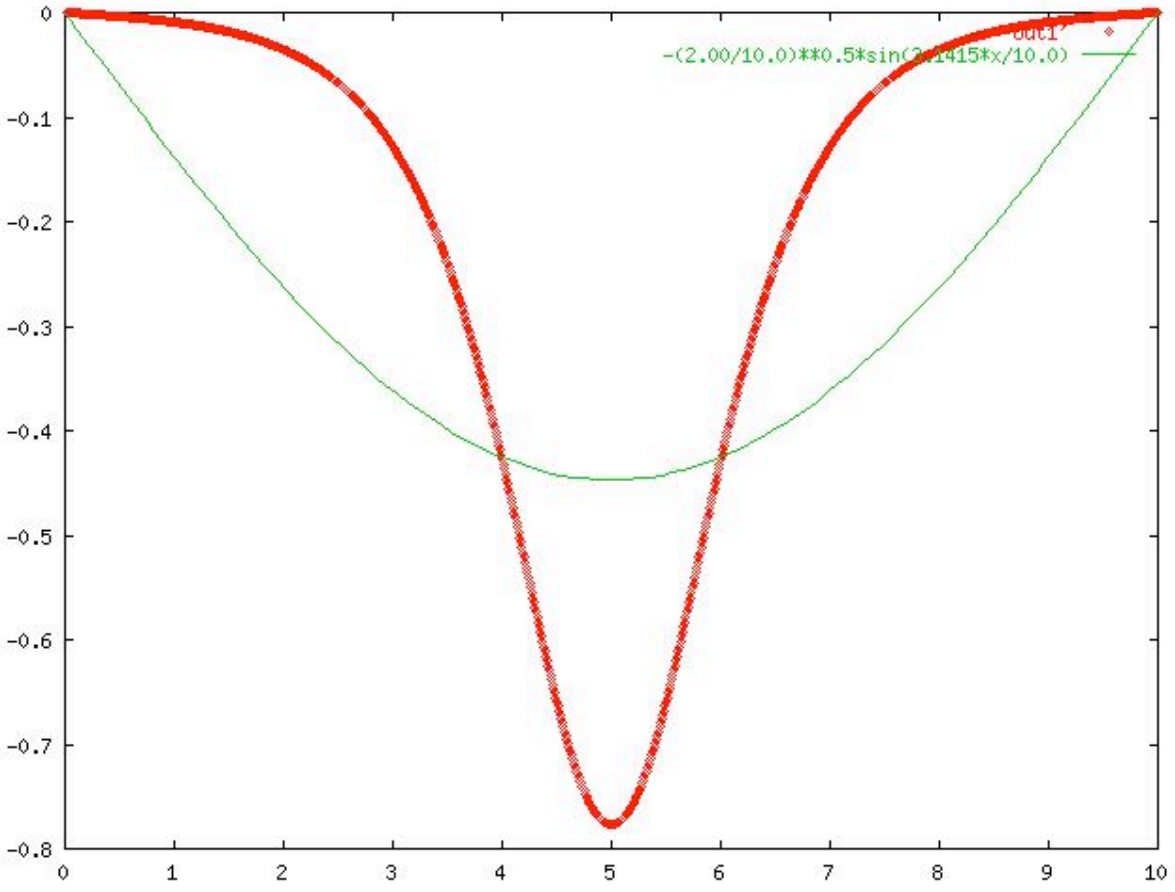
```
subroutine rs(nm,n,a,w,matz,z,fv1,fv2,ierr)
integer n,nm,ierr,matz
double precision a(nm,n),w(n),z(nm,n),fv1(n),fv2(n)
```

Results nmax=20

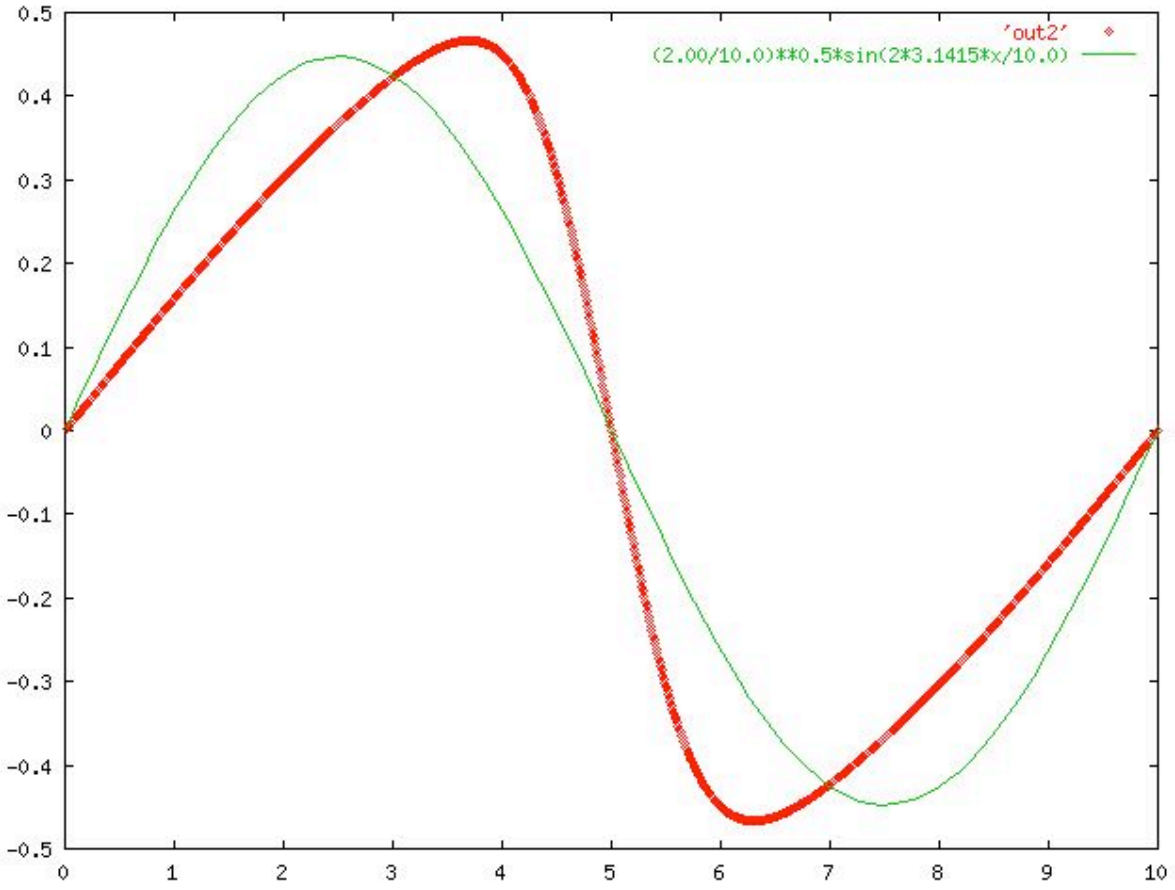
	$E_N^{(0)}$	E_N
N=1	0.0493	-0.8207
N=2	0.1974	0.0411
N=3	0.4441	0.2733
N=4	0.7896	0.5615
N=5	1.2337	1.0144

Does nmax value matter? It may make a difference!

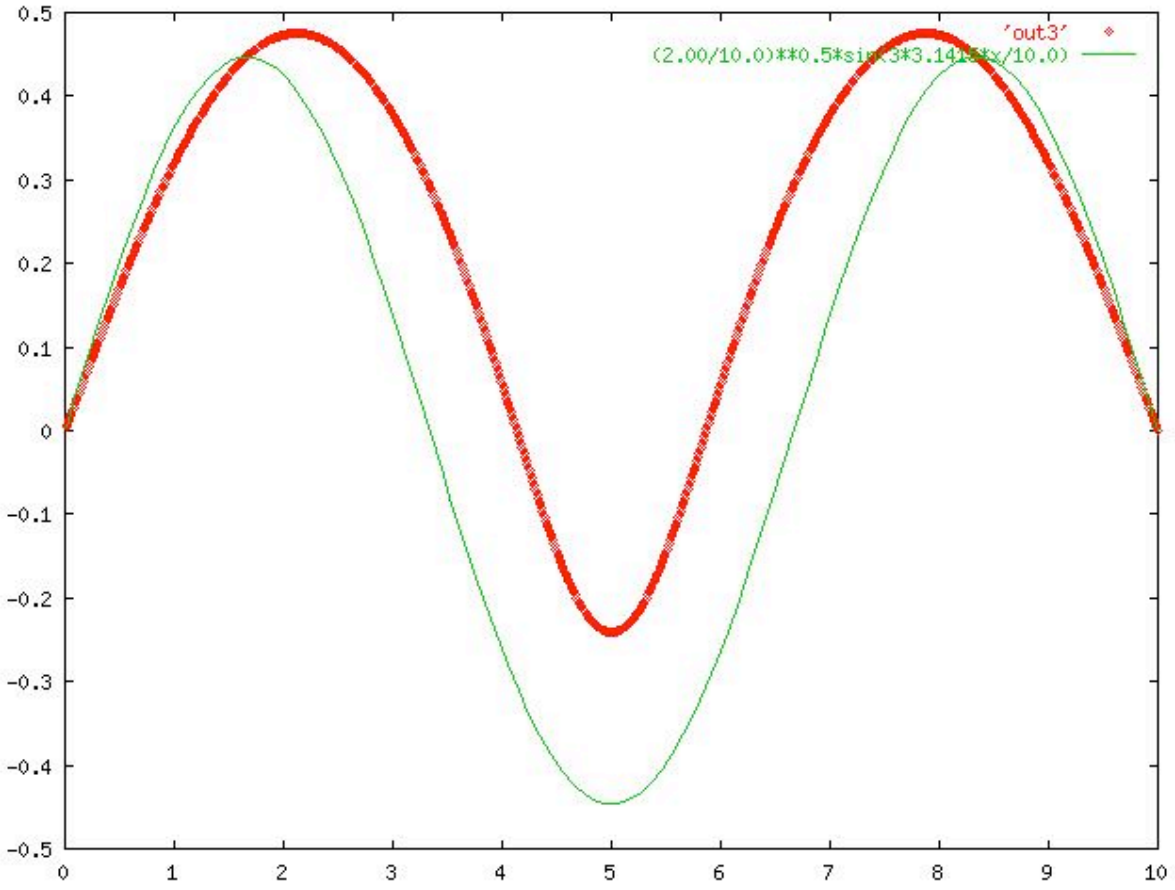
Wave function n=1



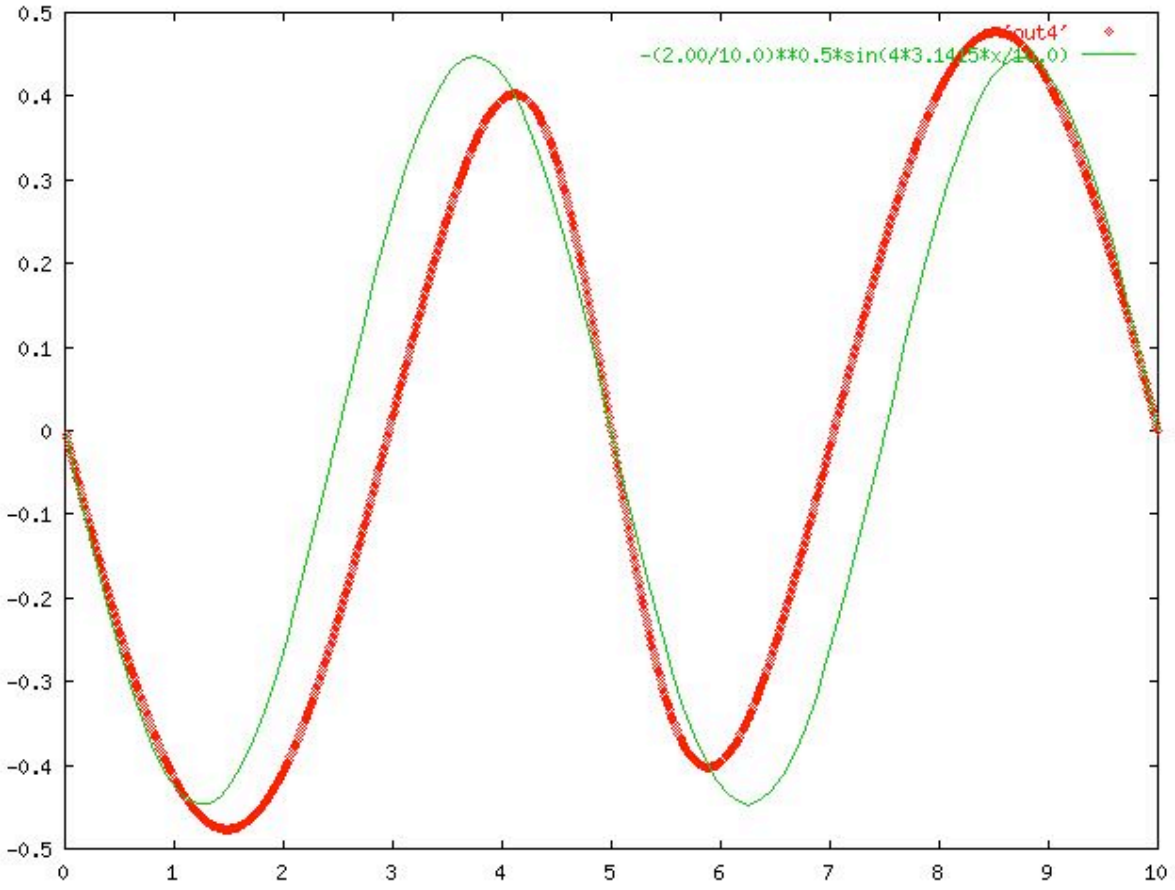
Wave function n=2



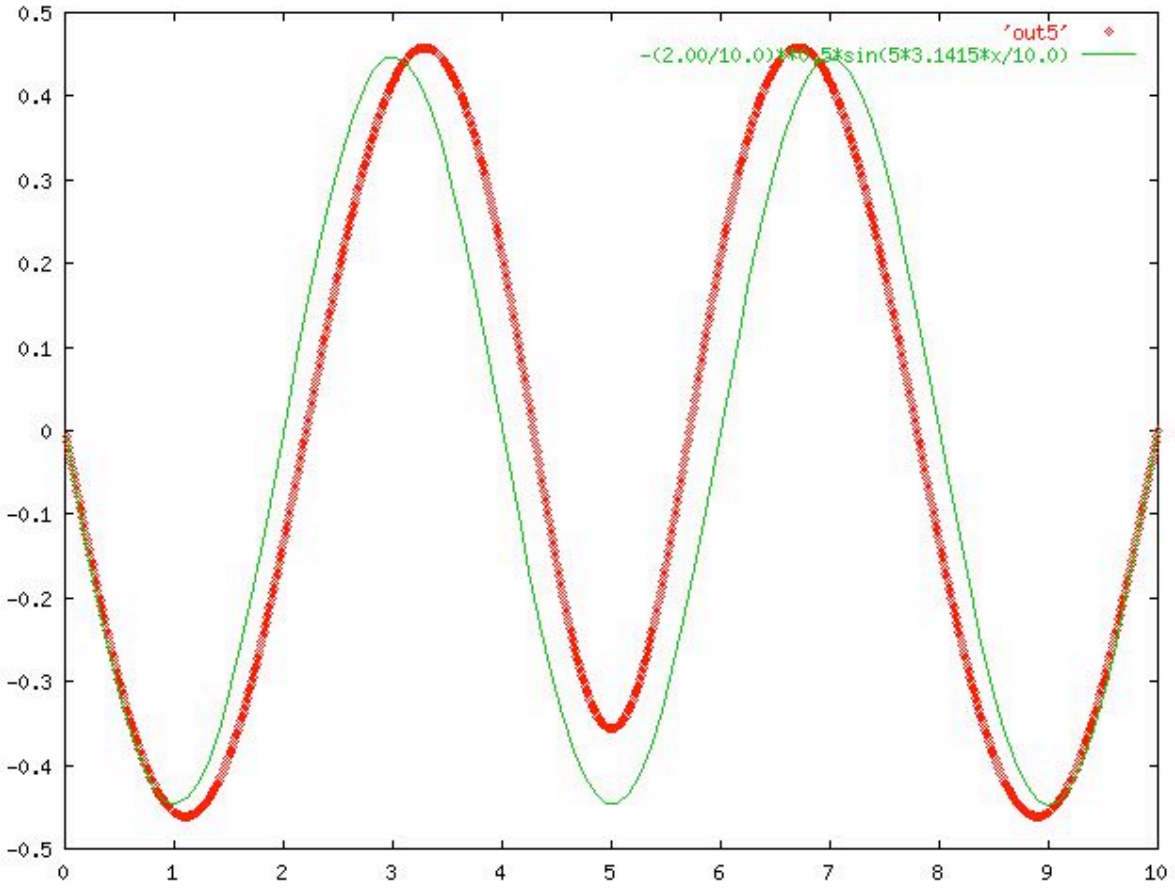
Wave function n=3



Wave function n=4



Wave function n=5



Estimate from perturbation theory with comparison…

	Estimate	E_N
N=1	-0.9876	-0.8207
N=2	0.0686	0.0411
N=3	0.3799	0.2733
N=4	0.5437	0.5615
N=5	1.0593	1.0144