```
 1: program raiz
 2: implicit real*8(a-e,g-h,o-z)
 3: integer N
 4: external func
 5: open(15,file="18do02exe2.txt")
 6: TOLX = 1.d-06
 7: X = .1
 8: DX = .5
 9: a_min = 2.5d0
10: a_max = 4.5d0
11: N = 1000
12: do i = 0, N
13: delt_a = (a_max - a_min)/1000.0d0
14: a = a_min + i*delt_a
15: call qraiz(func,a)
16: enddo
17: end
18:
19: subroutine qraiz(func,a)
20: implicit real*8(a-e,g-h,o-z)
21: TOLX = 1.d-06
22: X = .1
23: FOLD = func(X,a)
24: DX = .5
25: ITER = 0
26: 10 continue
27:    ITER = ITER + 1
28:    X = X + DX
29:    if ((FOLD*func(X,a)) .LT. 0) then
30:       X = X - DX
31:       DX = DX/2
32:    END IF
33:    if (ABS(DX) .GT. TOLX) GOTO 10
34:    write(15,*) a,X
35: return
36: end
37:
38: real*8 function func(E,a)
39: implicit real*8(a-h,o-z)
40: Double Precision Mass
41: parameter(V0 = 10.0d0)
42: parameter(Mass = 1.0d0, h_bar_sq = 7.619968d0)
43: alpha = dsqrt((2.d0*Mass*E)/h_bar_sq)
44: beta = dsqrt((2.d0*Mass*(V0-E))/ h_bar_sq)
45: func = beta*dcos(alpha*a) - alpha*dsin(alpha*a)
46: end
```