```fortran
 1: program aula25do02exer03
 2: PARAMETER (NNN = 100000)
 3: real K1, K2, K3, K4
 4: Dimension y(0:NNN)
 5: open(14,file="kutta-vetor.txt")
 6: open(15,file="erro-kutta-vetor.txt")
 7: H = 0.001
 8: NSTEP = (PI/3.)/H
 9: y(0) = -1.
10: DO IX = 0, NSTEP-1
11:     X = IX*H
12:     K1 = H*FUNC(X, Y(IX))
13:     K2 = H*FUNC((X + 1/2*H), (Y(IX) + 1/2*K1))
14:     K3 = H*FUNC((X + 1/2*H), (Y(IX) + 1/2*K2))
15:     K4 = H*FUNC((X + H), (Y(IX) + K3))
16:     Y(IX+1) = Y(IX) + 1./6.*(K1 + 2*K2 + 2*K3 + K4)
17:     DIFF = EXATA(X+H)-Y(IX+1)
18:     erro = abs(DIFF/EXATA(X+H))
19:     write(14,*)X+H,Y(IX+1),EXATA(X+H)
20:     WRITE(15,*)erro
21: enddo
22: end
23:
24: real function FUNC(X,Y)
25:     FUNC = cos(x)**2 - tan(x)*y
26: end
27:
28: real function exata(x)
29:     exata = sin(x)*cos(x)-cos(x)
30: end
```

```fortran
 1: program aula25do02exer03
 2: PARAMETER (NNN = 100000)
 3: PARAMETER (PI = ACOS(-1.0))
 4: real K1, K2, K3, K4
 5: Dimension y(0:NNN)
 6: open(14,file="kutta-vetor.txt")
 7: open(15,file="erro-kutta-vetor.txt")
 8: H = 0.001
 9: NSTEP = (PI/3)/H
10: y(0) = -1.
11: DO IX = 0, NSTEP-1
12:    X = IX*H
13:    K1 = H*FUNC(X, Y(IX))
14:    K2 = H*FUNC((X + 1/2*H), (Y(IX) + 1/2*K1))
15:    K3 = H*FUNC((X + 1/2*H), (Y(IX) + 1/2*K2))
16:    K4 = H*FUNC((X + H), (Y(IX) + K3))
17:    Y(IX+1) = Y(IX) + 1./6.*(K1 + 2*K2 + 2*K3 + K4)
18:    DIFF = EXATA(X+H)-Y(IX+1)
19:    erro = abs(DIFF/EXATA(X+H))
20:    write(14,*)X+H,Y(IX+1),EXATA(X+H)
21:    WRITE(15,*)erro
22: enddo
23: end
24:
25: real function FUNC(X,Y)
26:     FUNC = cos(x)**2 - tan(x)*y
27: end
28:
29: real function exata(x)
30:     exata = sin(x)*cos(x)-cos(x)
31: end
```