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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
```