

```

#COMPILE EXE
#DIM ALL
  REM *** Gaussian quadrature for n=24, September 2019
  REM *** currently evaluating integral from 0 to 2*pi of dx/(1+a*cos(x)) with
a=0.95
      GLOBAL n,fx,sum,pi,zz AS DOUBLE
FUNCTION PBMAIN
  DIM t(30) AS DOUBLE
  DIM w(30) AS DOUBLE
    t(1)=-0.9951872199:t(2)=-0.974728556:t(3)=-0.938274552:t(4)=-
0.886415527:t(5)=-0.820001986:t(6)=-0.740124192
    t(7)=-0.648093652:t(8)=-0.545421471:t(9)=-0.433793508:t(10)=-
0.31504268:t(11)=-0.191118867:t(12)=-0.064056893

t(13)=0.9951872199:t(14)=0.974728556:t(15)=0.938274552:t(16)=0.886415527:t(17)=0
.820001986:t(18)=0.740124192

t(19)=0.648093652:t(20)=0.545421471:t(21)=0.433793508:t(22)=0.31504268:t(23)=0.1
91118867:t(24)=0.064056893

w(1)=0.01234123:w(2)=0.028531389:w(3)=0.04427744:w(4)=0.059298585:w(5)=0.0733464
814:w(6)=0.0861901615

w(7)=0.097618652:w(8)=0.10744427:w(9)=0.115505668:w(10)=0.1216704729:w(11)=0.125
837456:w(12)=0.1279381953

w(13)=0.01234123:w(14)=0.028531389:w(15)=0.04427744:w(16)=0.059298585:w(17)=0.07
33464814:w(18)=0.0861901615

w(19)=0.097618652:w(20)=0.10744427:w(21)=0.115505668:w(22)=0.1216704729:w(23)=0.
125837456:w(24)=0.1279381953
      pi=3.14159
      sum=0
      FOR n=1 TO 24
        GOSUB 300
        sum=sum+fx*w(n)
      NEXT n
      PRINT sum
      INPUT "Shall we continue?";zz
      IF zz>0 THEN END
300 REM *** subroutine for fuction evaluation
  REM fx=0.5/LOG(0.5*(t(n)+1))+0.5/(1-0.5*(t(n)+1))
  REM fx=7/2*(7/2*t(n)+7/2-3*(7/2*t(n)+7/2)^2+(7/2*t(n)+7/2)^4)
  fx=pi/(1+0.95*COS(pi*t(n)+pi))
  REM fx=SIN(pi/2*t(n)+pi/2)*SIN(15*(pi/2*t(n)+pi/2))*pi/2
  RETURN
END FUNCTION

```

This logic yields 19.86102396, the analytic result is 20.1223.