ALGORITHM 57
BER OR BEI FUNCTION
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```
real procedure BERBEI (r, z); value r, z; real r, z;
comment This procedure computes ber(z) if r is set equal to
  zero. bei(z) is produced if r equals 1.0;
begin
                real s, k, c, f, t;
                if r = 0 then
                  s := 1
                else
                  s := (z × z)/4;
                k := s;
                f := z × z;
                f := f × f;
                for c := 2 step 2 until 100 do
                  begin
                    if s = s + k then
                      go to gate;
                    t := (c+r) × (c+r-1);
                    k := -0.0625 × k × f/(t × t);
                    s := s+k end;
gate: BERBEI := s
end BERBEI;
```

CERTIFICATION OF ALGORITHM 57
BER OR BEI FUNCTION [J. R. Herndon, *Comm. ACM* 4 (Apr. 1961)]
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Algorithm 57 was translated using the DEUCE ALGOL compiler. No corrections were required, and the results were satisfactory.

CERTIFICATION OF ALGORITHM 57
BER OR BEI FUNCTION [John R. Herndon, *Comm. ACM*, Apr. 1961]
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* Work supported by the U. S. Atomic Energy Commission.

The body of Algorithm 57 was tested on the LGP-30 using the ALGOL 60 translator developed by the Dartmouth College Computer Center. No syntactical errors were found. For $z = 0.1(0.1)1.0$, with a 7+ significant decimal arithmetic routine, the program gave results with errors less than 5 (and for $z = 1(1)5$ less than 12) in the seventh digit. For large values of z, serious cancellation errors may occur. For example, for $z = 20$, more than 2 decimals of significance can be lost in this way.