

ALGORITHM 49
SPHERICAL NEUMANN FUNCTION

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real procedure SPHBEN (r,x); value r,x; real r,x;
comment This procedure computes the spherical Neumann
function  $(\pi/2x)^{1/2}N_{r+1/2}(x)$ . Infinity is represented by  $10^{47}$ ;
begin real z, g, t;
    if x=0 then
        begin s := 10 ↑ 47;
            go to gate
        end;
    s := -cos (x)/x;
    if r = 0 then
        go to gate;
    t := sin (x)/x;
    for g := 1 step 1 until r do
        begin z := s;
            s := s × (g+g-1)/(x-t);
            t := z
        end;
gate: SPHBEN := s
end SPHBEN;
```