6. Bessel Function I, Asymptotic Expansion

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comment     Compute the Bessel Function I_n(X) when n and X
            are within the bounds of the asymptotic expansion.
            The procedure calling statement gives n, X and an
            absolute tolerance δ for determining the point at
            which the terms of the summation become in-
            significant;
procedure   I(n, X, δ) =: (IA)
begin
I:          r := 1  ;  pe := (4 × n² − 1) / (8 × X)
              sum := − pe
Repeat:     r := r + 1
            pe := pe × ((2 × n)² − (2 × r − 1)²) / (r × 8 × X)
if          (δ < abs (pe))
begin       sum := sum + (−1)^r × pe  ; go to Repeat end
            IA := (1 + sum) × (exp(X) / sqrt (2 × π × X))
              return
end
```