NEWTON'S METHOD

Algorithm 1 A Pseudocode for Newton's Method

INPUT $f, f', x, nmax, \delta_1, \delta_2, \epsilon$
integer $n, nmax,$ **real** $x, fx, fp, \epsilon, \delta_1, \delta_2, d$
external function f, f'
$fx \leftarrow f(x)$
OUTPUT $0, x, fx$
for $1 \leq k \leq nmax$ **do**
  $fp \leftarrow f'(x)$
  if $|fp| < \epsilon$ **then**
    OUTPUT "small derivative"
    RETURN
  end if
  $d \leftarrow fx/fp$
  $x \leftarrow x - d$
  $fx \leftarrow f(x)$
  OUTPUT n, x, fx
  if $|d| < \delta_1$ **or** $|fx| < \delta_2$ **then**
    OUTPUT "converge"
    RETURN
  end if
end for