ALGORITHM 2.3.

shamanskii$(\mathbf{F}, \mathbf{x}, \tau_a, \tau_r, m)$

Evaluate $\mathbf{F}(\mathbf{x})$; $\tau \leftarrow \tau_r \|\mathbf{F}(\mathbf{x})\| + \tau_a$.
while $\|\mathbf{F}(\mathbf{x})\| > \tau$ **do**
Compute $\mathbf{F}'(\mathbf{x})$; factor $\mathbf{F}'(\mathbf{x}) = \mathbf{LU}$.
if the factorization fails **then**
report an error and terminate
end if
for $p = 1 : m$ **do**
Solve $\mathbf{LUs} = -\mathbf{F}(\mathbf{x})$.
$\mathbf{x} \leftarrow \mathbf{x} + \mathbf{s}$
Evaluate $\mathbf{F}(\mathbf{x})$; if $\|\mathbf{F}(\mathbf{x})\| \leq \tau$ terminate.
end for
end while