7. (a) Develop an algorithm for Newton-Raphson method to solve $f(x) = 0$, starting with initial iterate x_0, n be the number of iterations allowed, eps be the prescribed relative error and delta be the prescribed lower bound for $f'(x)$.

→ **Algorithm** =)

Step 1: start

Step 2: Read x_0, eps, delta, n

Step 3: for $i = 1$ to n

Step 4: $f_0 \leftarrow f(x_0)$

Step 5: $f_0' \leftarrow f'(x_0)$

Step 6: if $|f_0'| \leq$ delta then Goto 12

Step 7: $x_1 \leftarrow x_0 - (f_0 / f'(0))$

Step 8: if $|(x_1 - x_0)/x_1| <$ eps then goto 14

Step 9: $x_0 \leftarrow x_1$

Step 10: write "Does not converge in n iteration"

Step 11: stop

Step 12: write "slope too small" x_0, f_0, f_0', i

Step 13: stop

Step 14: write "Convergent solution", $x_1, f(x_1), i$

Step 15: stop.