

Functionality Fact Sheet	SolveN
<p>Purpose: To obtain the numerical solution(s) to equations of a single variable</p> <p style="text-align: center;">SolveN($x \times 2^{-x} = 4x - 3$)</p>	<p>Location: Run-Matrix application Casio fx-CG20/50 Calculate application Casio fx-1AU GRAPH</p> <p>Initiated by: OPTN – CALC(F4) – SolveN (F5) CG20/50 Catalog – Function Analysis(2) – Solve Equation(5) fx-1AU</p>
<p>What it does: Finds up to ten values of the variable that satisfy the equation, giving exact values if it can.</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">⚠ Warning</p> <p style="text-align: center;">More solutions may exist .</p> <p style="text-align: center;">1 OK</p> </div> <p style="text-align: center; color: red;">It uses a numerical solution method so cannot guarantee to find all solutions</p>	<p>Initiated by: OPTN – CALC(F4) – SolveN (F5) CG20/50 Catalog – Function Analysis(2) – Solve Equation(5) fx-1AU</p>
<p>Full Syntax:</p> <p>SolveN(equation, variable, lower, upper)</p> <ul style="list-style-type: none"> equation – must be of a single variable⁽¹⁾ variable – x or A to Z⁽²⁾ lower – lower bound of domain for solution⁽²⁾⁽³⁾ upper – upper bound of domain for solution⁽²⁾⁽³⁾ <p>⁽¹⁾ If the equation is of the form $\exp=0$ the “=0” can be omitted and will be implied</p> <p>⁽²⁾ If the variable is x and the domain is unbounded, these inputs can be omitted</p> <p>⁽³⁾ Only solutions between lower and upper bound will be found.</p> <p>⁽³⁾ If bounds are not provided then (up to) 10 solutions closest to zero will be found.</p>	<p>Examples: Choose variable R – set domain to find positive solution</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">SolveN($\frac{4}{3}\pi R^3 = 1, R, 0, 1$)</p> <p style="text-align: center;">{0.6203504909}</p> </div> <p>‘=0’ implied, variable x implied, unbounded domain</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">SolveN($5x - \frac{1}{x}$)</p> <p style="text-align: center;">{$-\frac{\sqrt{5}}{5}, \frac{\sqrt{5}}{5}$}</p> </div> <p>bounded domain $0 \leq x \leq 4\pi$, two solutions found</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">SolveN($2\sin(\frac{x}{3}) - 1 = 0, x, 0, 4\pi$)</p> <p style="text-align: center;">{$\frac{1}{2}\pi, \frac{5}{2}\pi$}</p> </div> <p>unbounded domain, ten solutions found</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">SolveN($2\sin(\frac{x}{3}) - 1 = 0$)</p> <p style="text-align: center;">{$-\frac{11}{2}\pi, -\frac{7}{2}\pi, \frac{1}{2}\pi, \frac{5}{2}\pi, \frac{13}{2}$}</p> </div>
<p>Handy Hints:</p> <p>Entering ‘=’ Press: Shift – decimal point CG20/50 Press: Shift – left bracket key fx-1AU</p> <p>Obtaining decimal approximations Press EXE (exact sols shown) then press ‘S to D’ CG20/50 Press Shift then EXE fx-1AU</p> <p>OR Press EXE (exact sols shown) then arrow up (select sols) and press OK fx-1AU</p>	<p>Additional functionality: SolveN can be used in conjunction with other calculative structures like definite integrals and derivatives at a point.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">SolveN($\frac{d}{dx}(x^3 - x) _{x=A} = 1, A$)</p> <p style="text-align: center;">{$-\frac{\sqrt{6}}{3}, \frac{\sqrt{6}}{3}$}</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">SolveN($\int_{-2}^2 \frac{A(4-x^2)}{32} dx = 1, A$)</p> <p style="text-align: center;">{3}</p> </div>