Functionality Fact Sheet

ranedonancy race street

Purpose:
To obtain the numerical solution(s) to equations of a single variable

SolveN(
$$x\times2^{-x}=4x-3$$
)

SolveN

Location:

Run-Matrix application Calculate application

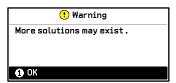
Casio fx-CG20/50 Casio fx-1AU GRAPH

Initiated by:

OPTN - CALC(F4) - SolveN (F5) CG20/50 Catalog - Function Analysis(2) - Solve Equation(5) fx-1AU

What it does:

Finds up to ten values of the variable that satisfy the equation, giving exact values if it can.



It uses a numerical solution method so cannot guarantee to find all solutions

Initiated by:

OPTN - CALC(F4) - SolveN (F5) CG20/50 Catalog - Function Analysis(2) - Solve Equation(5) fx-1AU

Full Syntax:

SolveN(equation, variable, lower, upper)

- **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⁾
 - (1) If the equation is of the form exp=0 the "=0" can be omitted and will be implied
 - (2) If the variable is x and the domain is unbounded, these inputs can be omitted
 - (3) Only solutions between lower and upper bound will be found.
 - (3) If bounds are not provided then (up to) 10 solutions closest to zero will be found.

Examples:

Choose variable R – set domain to find positive solution

SolveN
$$\left(\frac{4}{3}\pi R^3 = 1, R, 0, 1\right)$$

{0.6203504909}

'=0' implied, variable x implied, unbounded domain

SolveN
$$\left(5x-\frac{1}{x}\right)$$
 $\left\{-\frac{\sqrt{5}}{5}, \frac{\sqrt{5}}{5}\right\}$

bounded domain $0 \le x \le 4\pi$, two solutions found

$$\frac{\left(2\sin\left(\frac{x}{3}\right)-1=0,x,0,4\pi\right)}{\left\{\frac{1}{2}\pi,\frac{5}{2}\pi\right\}}$$

unbounded domain, ten solutions found

SolveN
$$\left(2\sin\left(\frac{x}{3}\right)-1=0\right)$$

 $\left(-\frac{11}{2}\pi, -\frac{7}{2}\pi, \frac{1}{2}\pi, \frac{5}{2}\pi, \frac{13}{2}\right)$

Handy Hints:

Entering '='

Press: Shift – decimal point CG20/50
Press: Shift – left bracket key fx-1AU

Obtaining decimal approximations

Press EXE (exact sols shown) then press 'S to D' CG20/50 Press Shift then EXE fx-1AU

OR

Press EXE (exact sols shown) then arrow up (select sols) and press OK fx-1AU

Additional functionality:

SolveN can be used in conjunction with other calculative structures like definite integrals and derivatives at a point.

$$\frac{d}{dx} \left(\frac{d}{dx} (x^3 - x) \Big|_{x=A} = 1, A \right) \\
\left\{ -\frac{\sqrt{6}}{3}, \frac{\sqrt{6}}{3} \right\}$$

$$e N \left(\int_{-2}^{2} \frac{A(4-x^{2})}{32} dx = 1, A \right)$$
 {3}