Nonlinear Equations

Your nonlinearity confuses me

$$ax^5 + bx^4 + cx^3 + dx^2 + ex + f = 0$$

$$\tanh(x) = x$$

http://nm.mathforcollege.com

1

If for a real continuous function $f(x)$, $f(a)f(b) < 0$, then in the domain $[a, b]$ for $f(x) = 0$, there is (are)

0

- one root — 0%
- undeterminable number of roots — 0%
- no roots — 0%
- at least one root — 0%

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3

The velocity of a body is given by $v(t) = 5e^{-t} + 4$, where t is in seconds and v is in m/s. We want to find the time when the velocity of the body is 6 m/s. The equation form needed for bisection and Newton-Raphson methods is

0

- $f(t) = 5e^{-t} + 4 = 0$ — 0%
- $f(t) = 5e^{-t} + 4 = 6$ — 0%
- $f(t) = 5e^{-t} = 2$ — 0%
- $f(t) = 5e^{-t} - 2 = 0$ — 0%

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4

To find the root of an equation $f(x) = 0$, a student started using the bisection method with a valid bracket of $[35, 55]$. At the end of the 2nd iteration, the smallest range for the absolute true error for the root of the equation is

0

- $0 \le |E_t| < 2.5$ — 0%
- $0 \le |E_t| < 5$ — 0%
- $0 \le |E_t| < 10$ — 0%
- $0 \le |E_t| < 20$ — 0%

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Given an equation $f(x) = 0$, where $f(x)$ is real and continuous, using the bisection method, one starts with a valid bracket of $[x_l, x_u]$. The first estimate of the root is then $x_m = \frac{x_l + x_u}{2}$. If now $f(x_l)f(x_m) = 0$,

0

The new bracket is $[x_m, x_u]$ 0%

No new bracket is needed as x_l is the new root of the equation 0%

The new bracket is $[x_l, x_m]$ 0%

No new bracket is needed as x_m is the new root of the equation 0%

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Name one pitfall of the bisection method of solving nonlinear equations

0

Nobody has responded yet.

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7

The formula for solving a nonlinear equation $f(x) = 0$ by Newton Raphson Method is given by

0

$x_{i+1} = x_i - \frac{f'(x_i)}{f(x_i)}$ 0%

$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)}$ 0%

$x_{i+1} = x_i + \frac{f(x_i)}{f'(x_i)}$ 0%

$x_{i+1} = x_i + \frac{f'(x_i)}{f(x_i)}$ 0%

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Given $f(x) = 7x^6 + 11x + 13$, and if one wants to find a local minimum of the function, we would solve the equation in the following form for the Newton-Raphson method.

0

$7x^6 + 11x + 13 = 0$ 0%

$42x^5 + 11 = 0$ 0%

$210x^4 = 0$ 0%

$7x^6 + 11x = -13$ 0%

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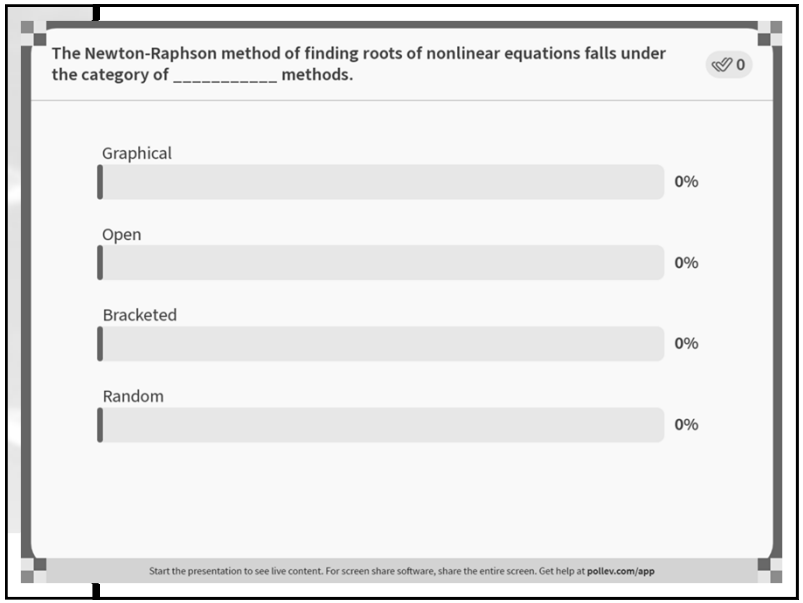
The Newton-Raphson method of finding roots of nonlinear equations falls under the category of _____ methods.
0
Graphical
0%
Open
0%
Bracketed
0%
Random
0%
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Name one pitfall of the Newton-Raphson method of solving a nonlinear equation.
0
Nobody has responded yet.
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