Abdullah Sevket Dogu
0222022 4874

1) $x^3 - 2x^2 - 5 = 0$

[2,4] 4 iterasyon bisection

$f(x_a) = -5$
$f(x_b) = 27$
$f(x_k) = 4$

$x_a \cdot x_b < 0$ kök var

$x_a = 2$
$x_b = 4$

$x_k = \frac{x_a + x_b}{2} = 3$

2) [2,3]

$x_a = 2$
$x_b = 3$
$x_k = 2,5$

$f(x_a) = -5$
$f(x_b) = 4$
$f(x_k) = -1,875$

$f(x_a) \cdot f(x_b) < 0$ kök var

3) [2,5, 3]

$x_a = 2,5$
$x_b = 3$
$x_k = 2,75$

$f(x_a) = -1,875$
$f(x_b) = 4$
$f(x_k) = 0,671875$

$f(x_a) \cdot f(x_b) < 0$ kök var

4) [2,5, 2,75]

$x_a = 2,5$
$x_b = 2,75$
$x_k = 2,625$

$f(x_a) = -1,875$
$f(x_b) = 0,671875$
$f(x_k) = -0,693359375$

$f(x_a) \cdot f(x_b) < 0$ kök var

$x_k = 2,625$
$f(x_k) = -0,693359375$

Abdullah Sabri Ergin
0222002245?4

1) $x^3+4x^2-10=0$ [1,2] 4 iterasyon

$x_a = 1$ $f(x_a) = -5$ $f(x_a) \cdot f(x_ü) < 0$
$x_ü = 2$ $f(x_ü) = 14$ kök var
$x_k = 1{,}5$ $f(x_k) = 2{,}375$

2) [1, 1,5]

$x_a = 1$ $f(x_a) = -5$ $f(x_a) f(x_ü) < 0$
$x_ü = 1{,}5$ $f(x_ü) = 2{,}375$ kök var
$x_k = 1{,}25$ $f(x_k) = -1{,}796875$

3) [1,25, 1,5]

$x_a = 1{,}25$ $f(x_a) = -1{,}796875$ $f(x_a) \cdot f(x_ü) < 0$
$x_ü = 1{,}5$ $f(x_ü) = 2{,}375$ kök var
$x_k = 1{,}375$ $f(x_k) = 0{,}162109...$

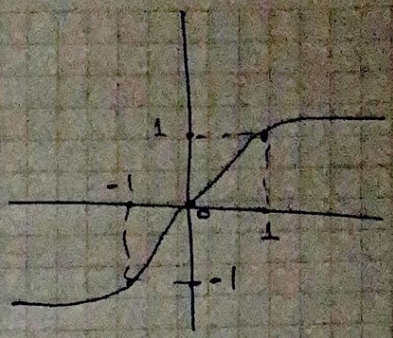
4) [1,25, 1,375]

$x_a = 1{,}25$ $f(x_a) = -1{,}796875$
$x_ü = 1{,}375$ $f(x_ü) = 2{,}375$
$x_k = 1{,}3125$ $f(x_k) = -0{,}848388...$

$x_k = 1{,}3125$
$f(x_k) = -0{,}848388...$

Abdullah Sevket Eroğlu
0222022457

$f(x) = x^{1/3}$ grafiği ⟶
x ekseninde 0'da kesiyor



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

$$x_i - \frac{f(x_i)}{f'(x_i)} = x_i - \frac{x_i^{1/3} \cdot x_i^{2/3}}{\frac{1}{3}} = x_i - 3x_i = -2x_i \quad x_i \neq 0$$

x "0" hariç her değeri alabilir. Fakat son hali bir doğrusal fonk. yani her adımda kökten uzaklaşacak

Newton-Raphson kullanmıyız

$f(x) = 4 \cdot e^{-0.5x} - x$ $\quad f'(x) = 4 \cdot (-0.5) \cdot e^{-0.5x} - 1 = -2e^{-0.5x} - 1$

$x_0 = 2$ için 4 iterasyon

1) $x_1 = x_0 - \frac{f(x_0)}{f'(x_0)} = 2 + \frac{4 \cdot e^{-1} - 2}{2 \cdot e^{-1} + 1} = \frac{8 \cdot e^{-1}}{2 \cdot e^{-1} + 1} = 1,695532$

$x_1 = 1,695532$

2) $x_2 = x_1 - \frac{f(x_1)}{f'(x_1)} = 1,705200216$ $\quad x_2 = 1,705200216$

3) $x_3 = x_2 - \frac{f(x_2)}{f'(x_2)} = 1,705211004$ $\quad x_3 = 1,705211004$

4) $x_4 = x_3 - \frac{f(x_3)}{f'(x_3)} = 1,705211004$ $\quad x_4 = 1,705211004$

$x_4 = 1,705211004$