

find root of $e^x = 3x + 4$ on $[0, 4]$

rewrite: $f(x) = e^x - 3x - 4$

x	0	1	2	3	4
f(x)	-3	-1.2817	-2.6109	7.0855	38.5982

↪ sign change

root has to be
between $[2, 3]$

it+1: $x_0 = 2$ $x_1 = 3$

$$x_2 = 3 - f(3) \cdot \frac{3 - 2}{f(3) - f(2)}$$

$$x_2 = \underline{2.2693}$$

$|x_1 - x_2| < 10^{-3}$
continue

it+2: $x_0 = 3$ $x_1 = 2.2693$

$$x_2 = 2.2693 - f(2.2693) \cdot \frac{2.2693 - 3}{f(2.2693) - f(3)}$$

$$x_2 = \underline{2.3702}$$

$|x_2 - x_1| < 10^{-3}$
continue

it+3: $x_0 = 2.2693$ $x_1 = 2.3702$

$$x_2 = 2.3702 - f(2.3702) \cdot \frac{2.3702 - 2.2693}{f(2.3702) - f(2.2693)}$$

$$\underline{x_2 = 2.4275}$$

$$|x_2 - x_1| < 10^{-3}$$

continue

it+4: $x_0 = 2.3702$

$$x_1 = 2.4275$$

$$x_2 = 2.4275 - f(2.4275) \cdot \frac{2.4275 - 2.3702}{f(2.4275) - f(2.3702)}$$

$$\underline{\underline{x_2 = 2.4215}}$$

$$|x_2 - x_1| < 10^{-3}$$

continue

it+5: $x_0 = 2.4275$

$$x_1 = 2.4215$$

$$x_2 = 2.4215 - f(2.4215) \cdot \frac{2.4215 - 2.4275}{f(2.4215) - f(2.4275)}$$

$$\underline{\underline{x_2 = 2.4217}}$$

approx. root

$$|x_2 - x_1| = 0.002 < 10^{-3}$$

STOP!

