

MÉTODO PUNTO FIJO

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ANÁLISIS NUMÉRICO

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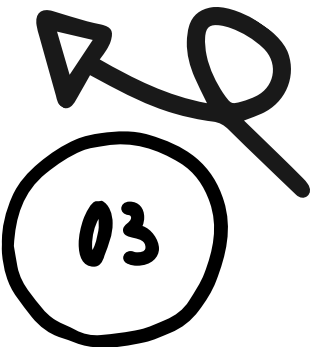
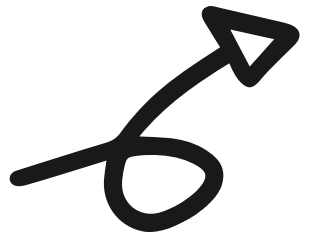
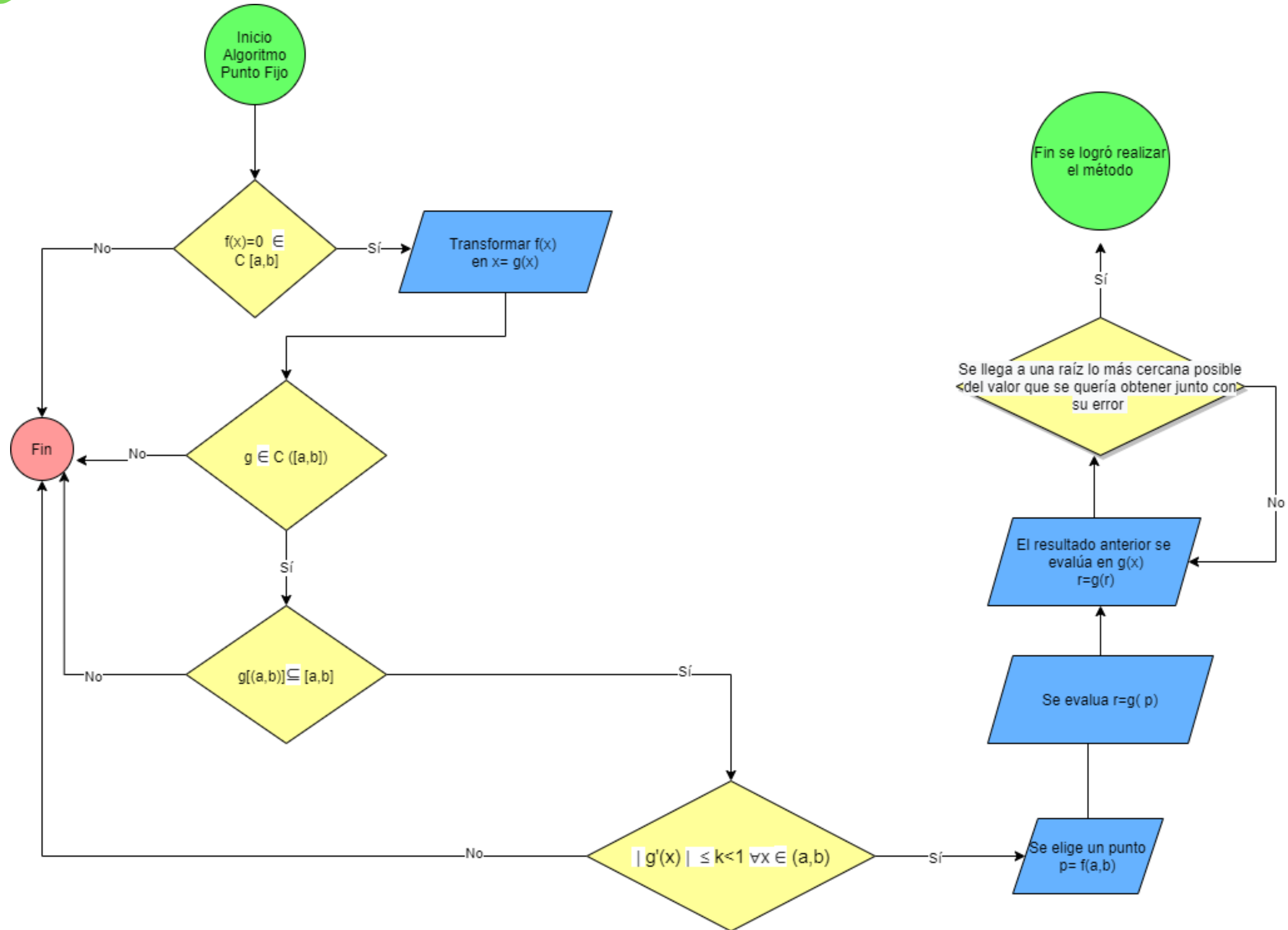
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AGENDA

método punto fijo

- 01 Diagrama de flujo.
- 02 Resultados.
- 03 Comparación de algoritmos.

DIAGRAMA DE FLUJO



“RESULTADOS”

CASO 1

$$f(x) = \cos^2(2x) - x^2$$

RAÍCES WOLFRAM

Solution:

$$x \approx 0.514933$$

$$g(x) =$$

$$\cos^2(2x) - x^2 = 0$$

$$\cos^2(2x) = x^2$$

$$\sqrt{\cos^2(2x)} = x$$

WOLFRAM

$$g(x) =$$

Input:

$$x = \sqrt{\cos^2(2x)}$$

$$g(1) = \sqrt{\cos^2(2(1))} =$$

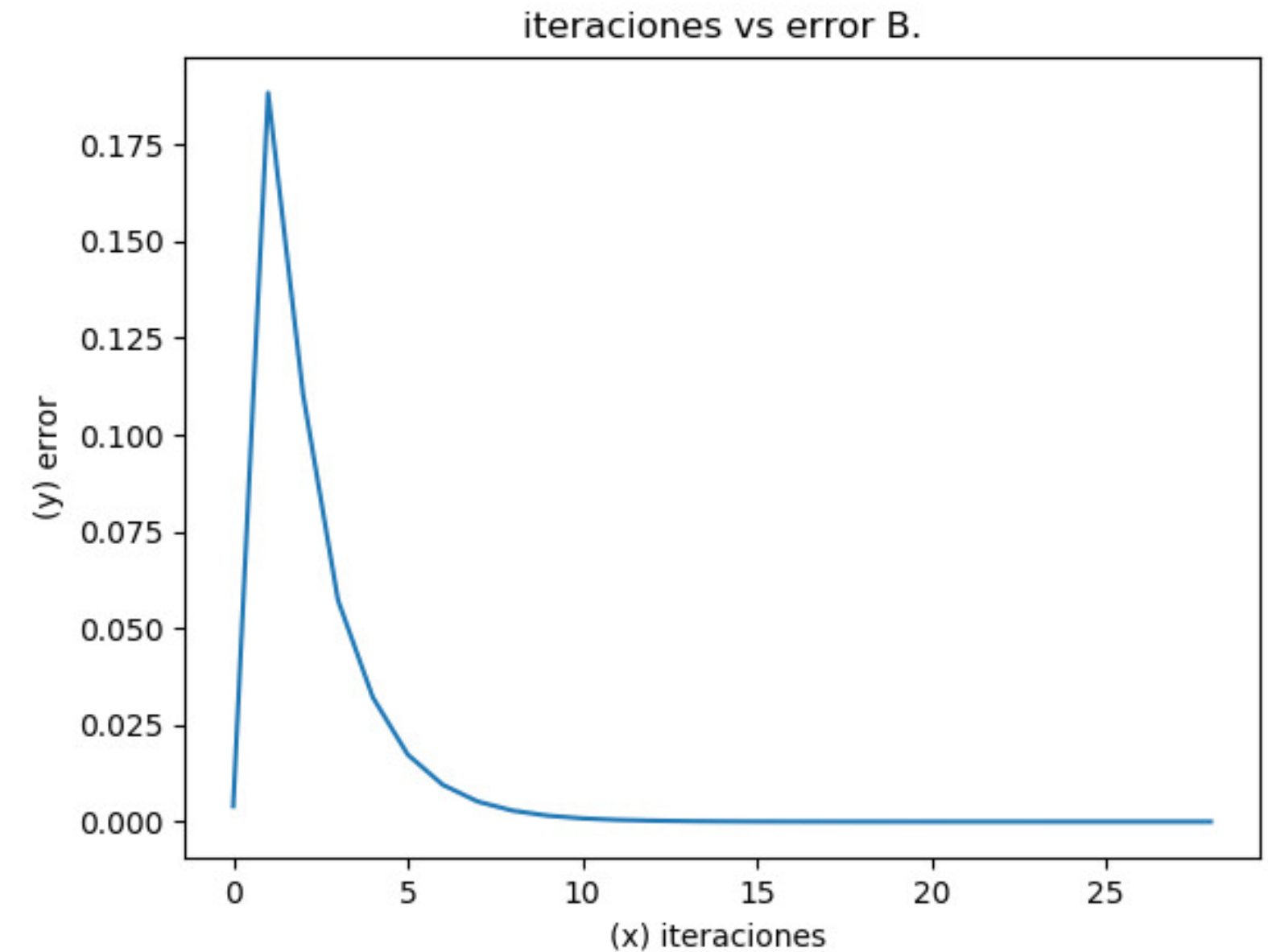
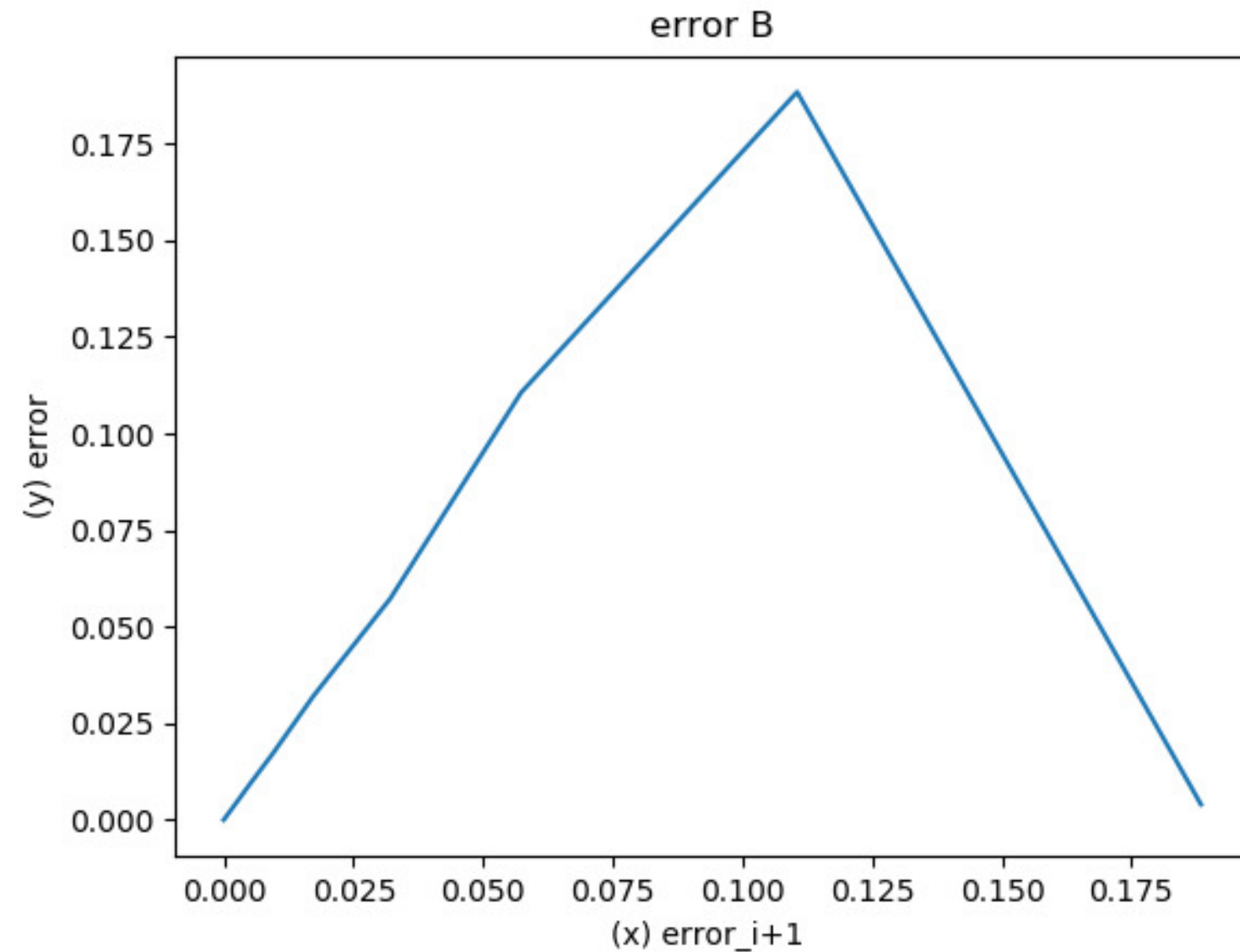
$$(\text{Decimal: } 0.41614\dots)$$

$$\frac{d}{dx} \left(\sqrt{\cos^2(2 \cdot 1)} \right) = 0$$

$$g(x)' < 1$$

CASO 2

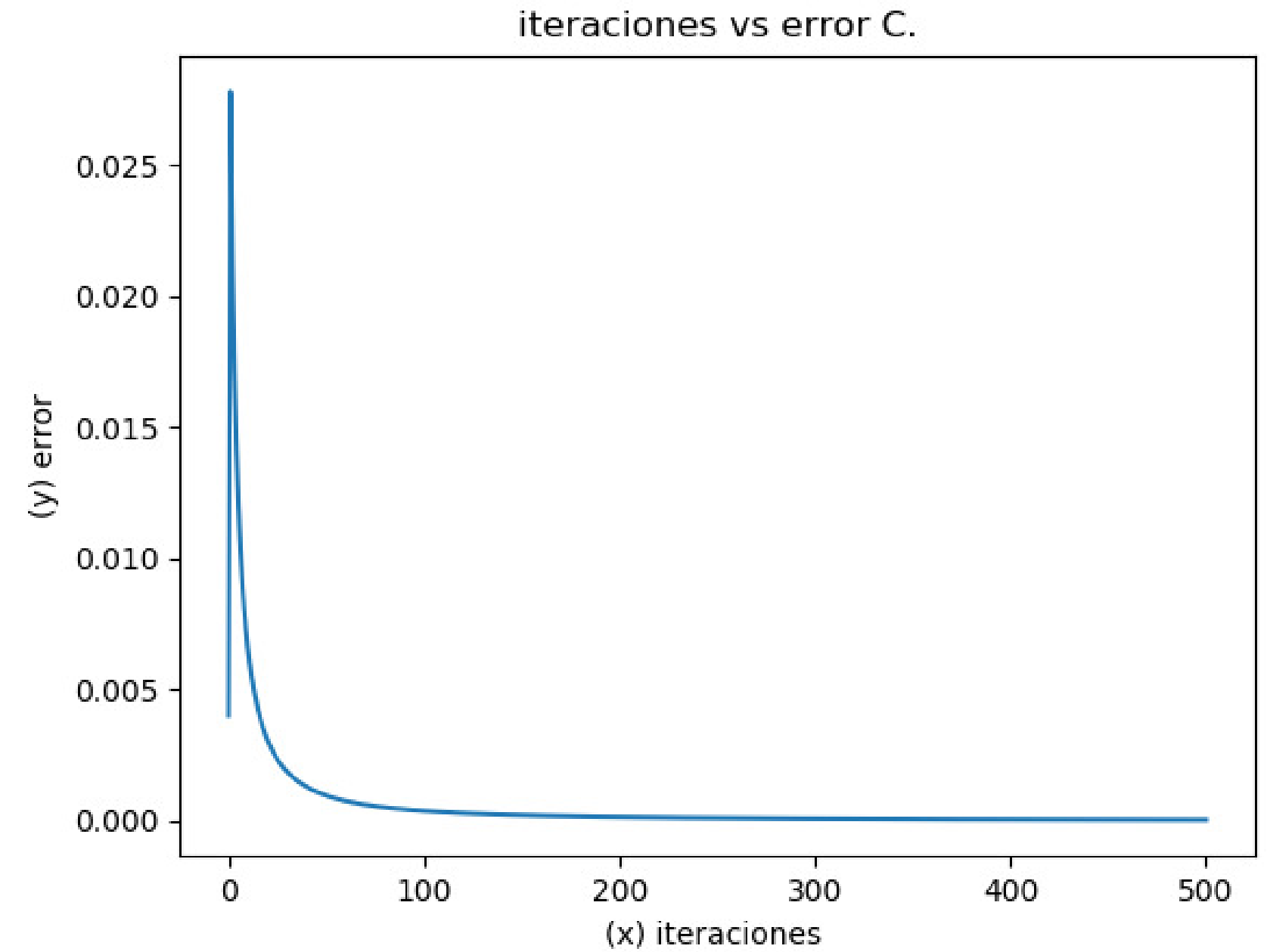
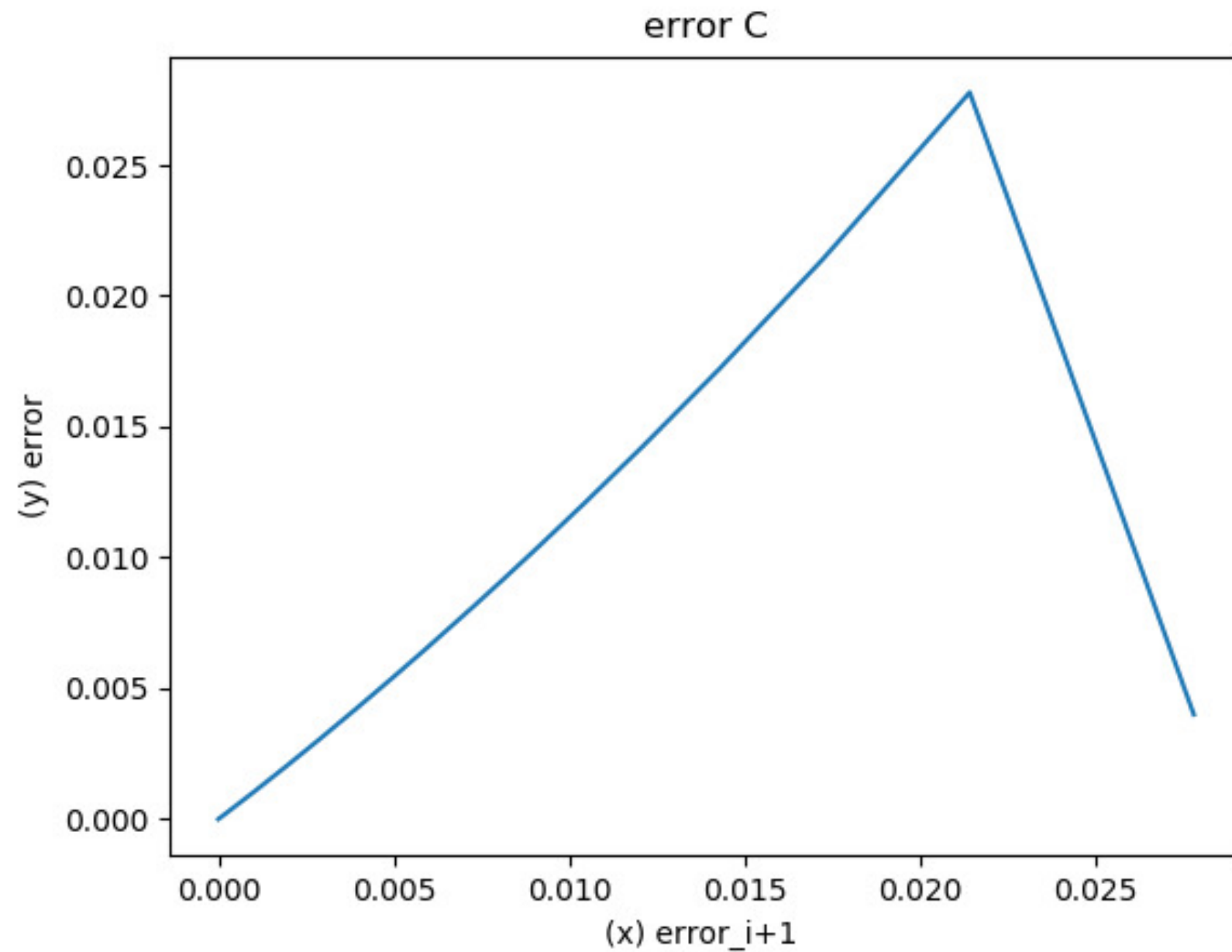
$$f(x) = x \operatorname{Sen}(x) - 1 \text{ en } [1, 2]$$



```
p29 = 1.11415714409162469600  
Raiz: 1.1141571440916247  
Iteraciones: 29
```

CASO 3

$$f(x) = x^3 - 2x^2 + \frac{4}{3}x - \frac{8}{27}$$



```
p118551 = 0.66903791521086608540  
Raiz: 0.6690379152108661  
Iteraciones: 118551
```

COMPARACIÓN RESULTADOS

↓ CASO 2 $f(x) = x \operatorname{Sen}(x) - 1$ en $[1, 2]$

Input:

$$g(x) = x = \frac{1}{\sin(x)}$$

RESULTADO ALGORITMO

```
p29 = 1.11415714409162469600
Raiz: 1.1141571440916247
Iteraciones: 29
```

RAÍZ WOLFRAM

Numerical solutions:

$$x \approx \pm 18.9024837303424...$$

$$x \approx \pm 12.6455325787891...$$

$$x \approx \pm 9.31724294141481...$$

$$x \approx \pm 6.43911723841725...$$

$$x \approx \pm 2.77260470826599...$$

$$x \approx \pm 1.11415714087193...$$

↓ CASO 3 $f(x) = x^3 - 2x^2 + \frac{4}{3}x - \frac{8}{27}$

Input:

$$g(x) = x = -\frac{3}{4}x^3 + \frac{3}{2}x^2 + \frac{2}{9}$$

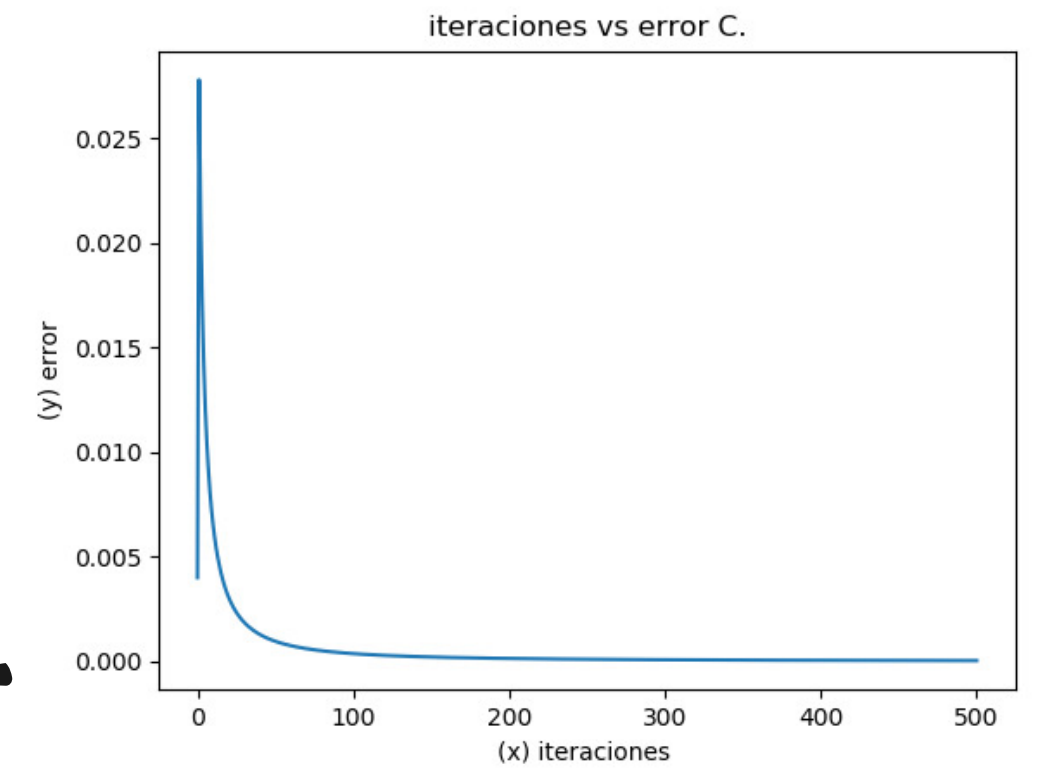
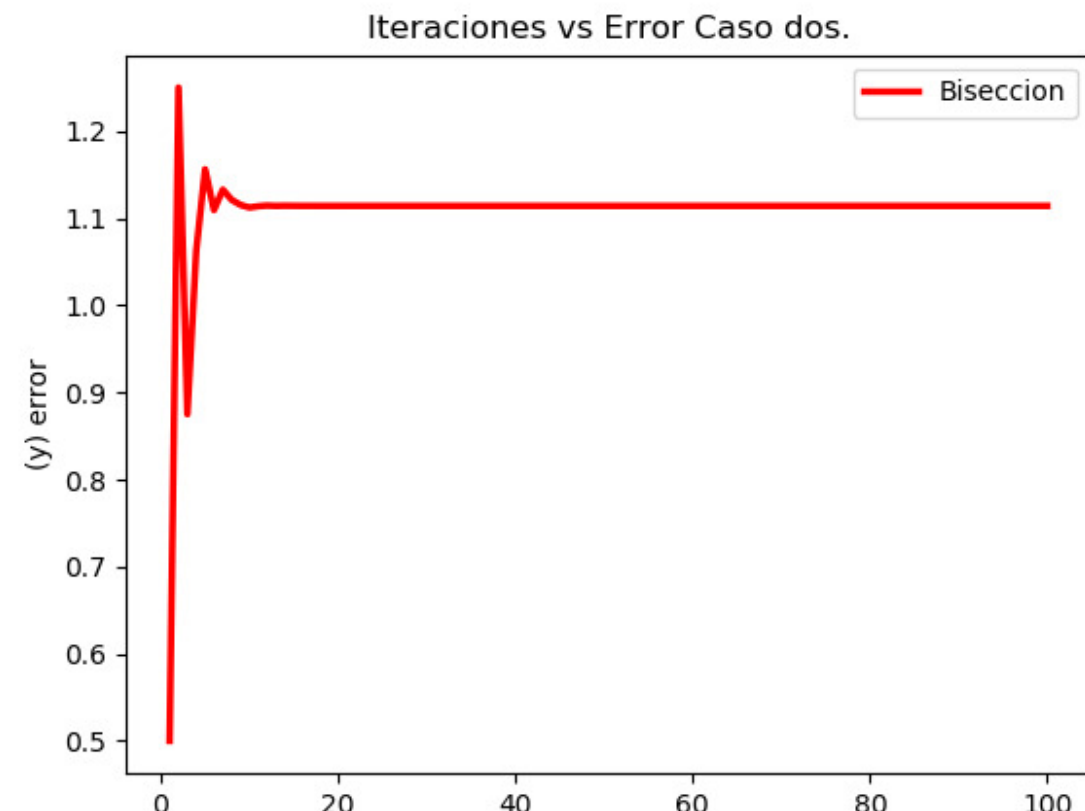
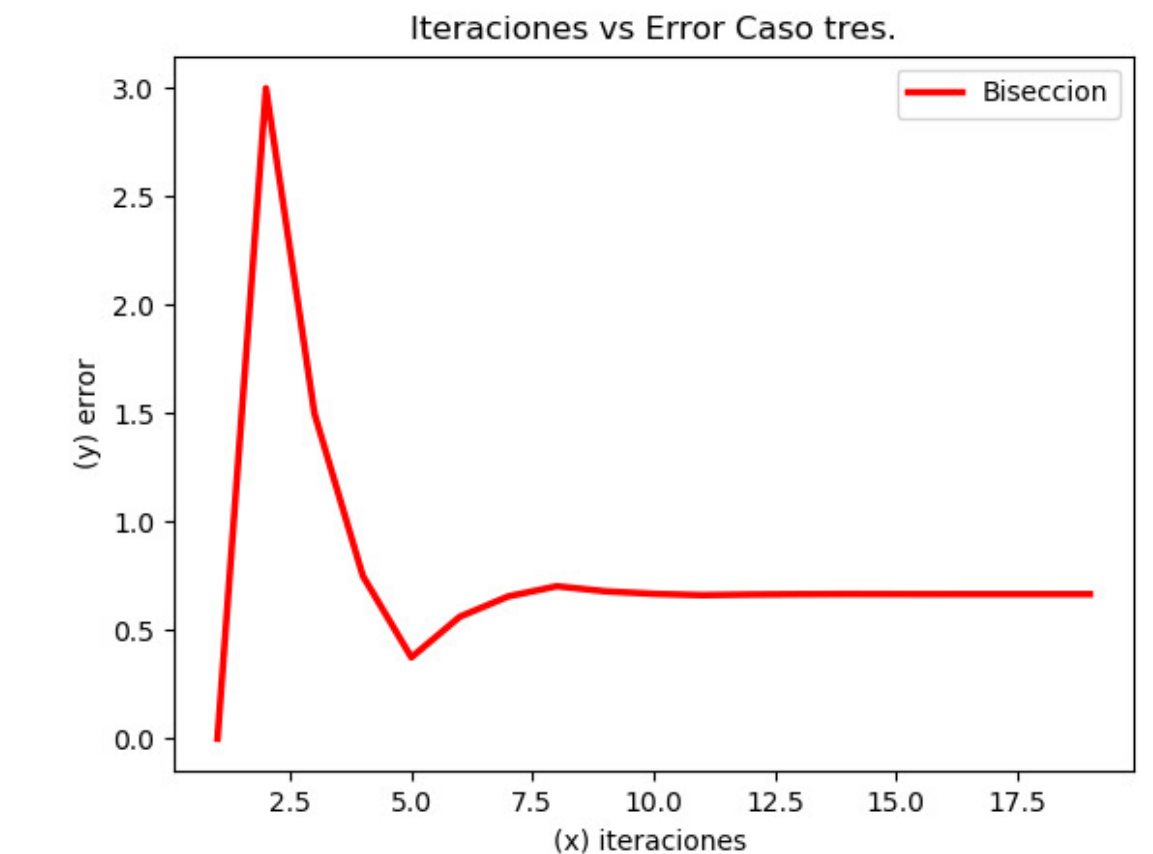
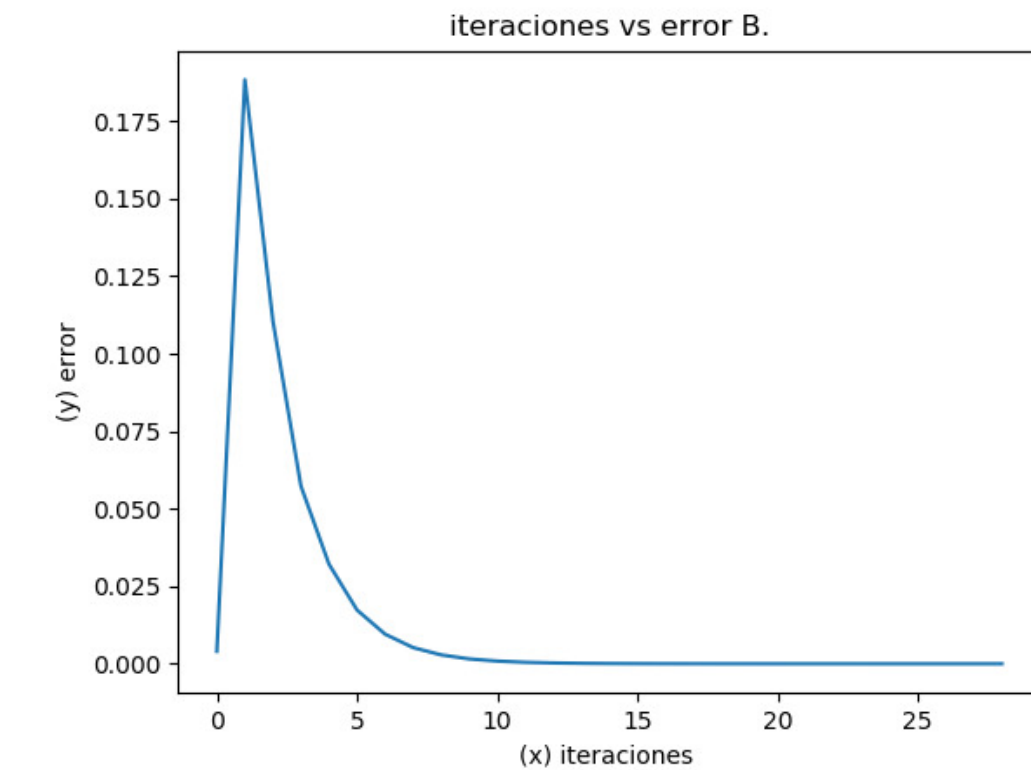
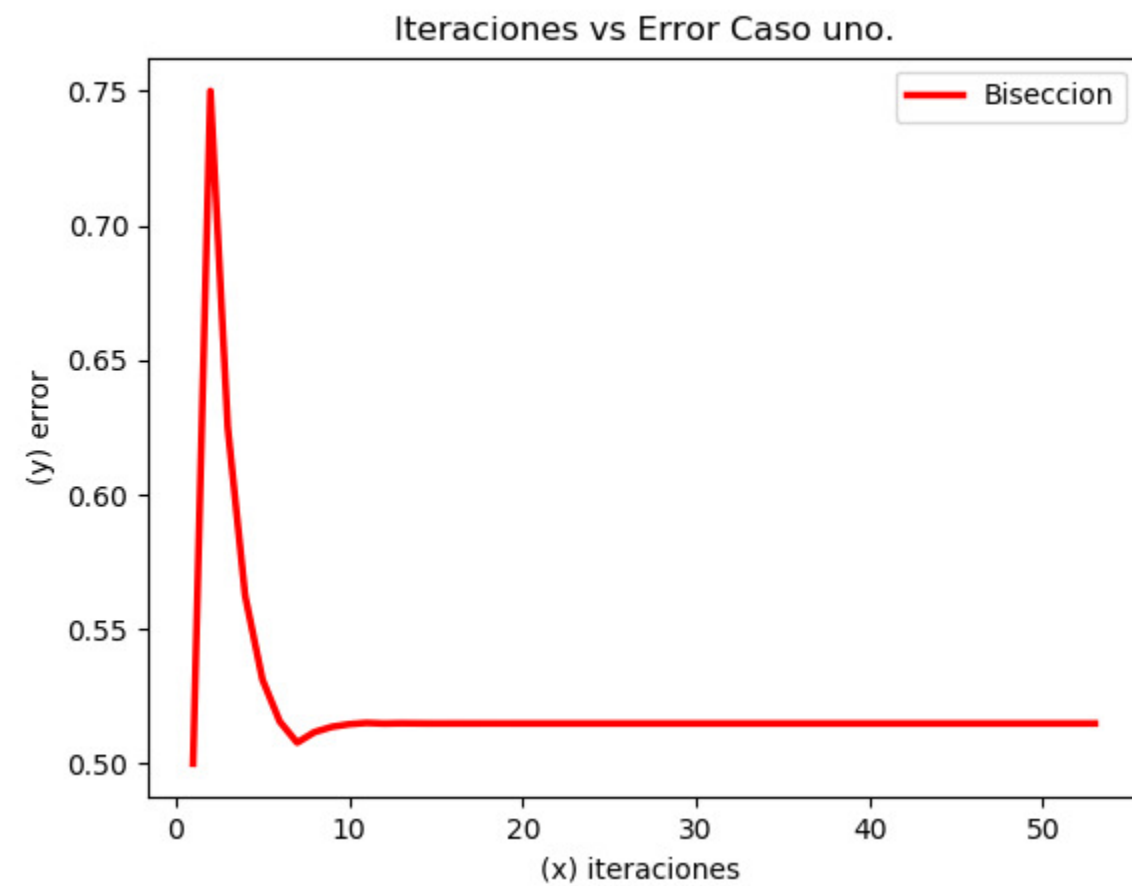
RAÍZ WOLFRAM

Solution:

$$x \approx 0.66667$$

```
p118551 = 0.66903791521086608540
Raiz: 0.6690379152108661
Iteraciones: 118551
```

COMPARACIÓN PUNTO FIJO VS BISECCIÓN



GRACIAS

