

Método de la Secante Modificada

$$\sin(x) * x^2 + 3$$

$$x_0 = 3.5$$

$$\delta = 0.01$$

$$\text{maxiter} = 5$$

$$\text{tol} = 0.0001$$

1 iter

$$x_{\text{new}} = x_{\text{old}} - \frac{\delta * (x_{\text{old}}) f(x_{\text{old}})}{f[x_{\text{old}} + (\delta) * x_{\text{old}}] - f(x_{\text{old}})}$$

$$x_{\text{new}} = 3.5 - \frac{0.01 (3.5) * [\sin(3.5) * 3.5^2 + 3]}{f[3.5 + 0.01 * 3.5] - [\sin(3.5) * 3.5^2 + 3]}$$

↳ $\sin(3.535) * (3.535)^2 + 3$

$$= 3.4079$$

$$e_a = \left| \frac{3.4079 - 3.5}{3.4079} * 100 \right|$$

$$= 2.7025 \%$$

$$\begin{aligned} X_{\text{new}} &= 3.4079 - \frac{0.01 (3.4079) \times [\sin(3.4079) \times 3.4079^2 + 3]}{f[3.4079 + 0.01 \times 3.4079] - [\sin(3.4079) \times 3.4079^2 + 3]} \\ &\rightarrow \sin(3.4419) \times (3.4419)^2 + 3 \\ &= 3.4036 \end{aligned}$$

$$e_a = \left| \frac{3.4036 - 3.4079}{3.4036} \times 100 \right| = 2.8293 \%$$

$$\begin{aligned} X_{\text{new}} &= 3.4036 - \frac{0.01 (3.4036) \times [\sin(3.4036) \times 3.4036^2 + 3]}{f[3.4036 + 0.01 \times 3.4036] - [\sin(3.4036) \times 3.4036^2 + 3]} \\ &\rightarrow \sin(3.4376) \dots \\ &= 3.4035 \end{aligned}$$

$$e_a = \left| \frac{3.4035 - 3.4036}{3.4035} \times 100 \right| = 2.9381 \times 10^{-3} \% = 0.00293$$

(4)

$$x_{\text{new}} = 3.4035 - \frac{0.01(3.4035) * [\sin 3.4035 * 3.4035^2 + 3]}{f(3.4035 + 0.01 * 3.4035) - [\sin 3.4035 * 3.4035^2 + 3]}$$

→ $\sin(3.4375) \dots$

$$= 3.4036$$

$$ea = \left| \frac{3.4035 - 3.4036}{3.4035} * 100 \right|$$

$$= 2.9381 \times 10^{-3}$$

Raíz →

3.4036

Se repite en iter (2) = 3.4036 , iter (3) = 3.4035 ,
iter (4) = 3.4036