

1. <sup>A</sup>Newton-method

$$X_{n-1} = X_n - \frac{f(x_n)}{f'(x_n)} \quad X_n = X_{n-1} - \frac{f(X_{n-1})}{f'(X_{n-1})}$$

$$f(x) = x^3 - 9x^2 + 11x - 11$$

$$x_0 = 0 \quad f'(x) = 3x^2 - 18x + 11$$

$$f(x_0) = -11 \quad f'(x_0) = 11$$

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)} = 0 - \frac{-11}{11} = 1$$

$$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)} = 1 - \frac{-8}{-4} = 3$$

$$x_3 = x_2 - \frac{f(x_2)}{f'(x_2)} = 3 - \frac{-32}{-16} = 1$$

$\Rightarrow$  the root  $\in (1, 3)$

maybe 2