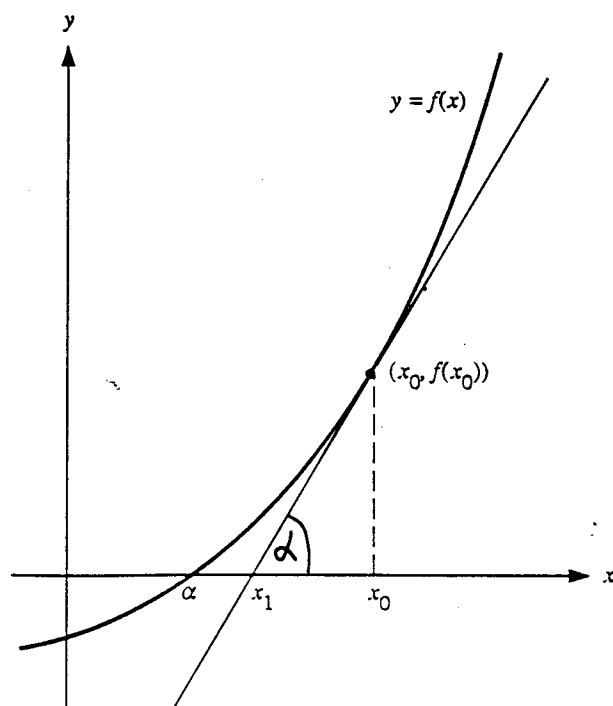


Metoda Newtona



$$\operatorname{tg} \alpha = f'(x_0) = \frac{f(x_0)}{x_0 - x_1}$$

Więc

$$x_1 = x_0 - \frac{f(x_0)}{f'(x_0)},$$

i dalej

$$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)},$$

formuła iteracyjna:

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

bardzo szybkie

Przykład

$$f(x) = x^6 - x - 1,$$

$$f'(x) = 6x^5 - 1,$$

Table 4.2. Newton's Method for $x^6 - x - 1 = 0$

n	x_n	$f(x_n)$	$x_n - x_{n-1}$
0	1.5	$8.89E+1$	
1	1.30049088	$2.54E+1$	$-2.00E-1$
2	1.18148042	$5.38E-1$	$-1.19E-1$
3	1.13945559	$4.92E-2$	$-4.20E-2$
4	1.13477763	$5.50E-4$	$-4.68E-3$
5	1.13472415	$7.11E-8$	$-5.35E-5$
6	1.13472414	$1.55E-15$	$-6.91E-9$

$$x_{n+1} = x_n - \frac{x_n^6 - x_n - 1}{6x_n^5 - 1}, \quad n \geq 0$$