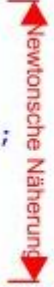


Newtonverfahren

Dokumentnummer: DX1057
Fachgebiet: Näherungsverfahren
Tangenten
Gleichungen

Problembeschreibung

```
"Näherungsverfahren"$  
f(x) := x^2 - 8*x + 12;  
f(x) := x^2 - 8 x + 12  
ab:diff(f(x),x);  
2 x - 8  
a(x) := 2*x - 8;  
a(x) := 2 x - 8  
*****$  
x[0] : 7;  
7  
g(n) := x[n+1] : x[n] - f(x[n]) / a(x[n]);  
g(n) := x_{n+1} : x_n - \frac{f(x_n)}{a(x_n)}  
*****$
```



Problemlösung

```
>> f(x):=x**2-8*x+12;ab:diff(f(x),x);a(x):="ab;
```

```
(%o1) f(x) := x2 - 8 x + 12
```

```
(%o2) 2 x - 8
```

```
(%o3) a(x) := 2 x - 8
```

Nherungsweise Lsung von Gleichungen: Newtonverfahren

```
>> x[0]:7;g(n):=x[n+1]:x[n]-f(x[n])/a(x[n]);
```

```
(%o4) 7
```

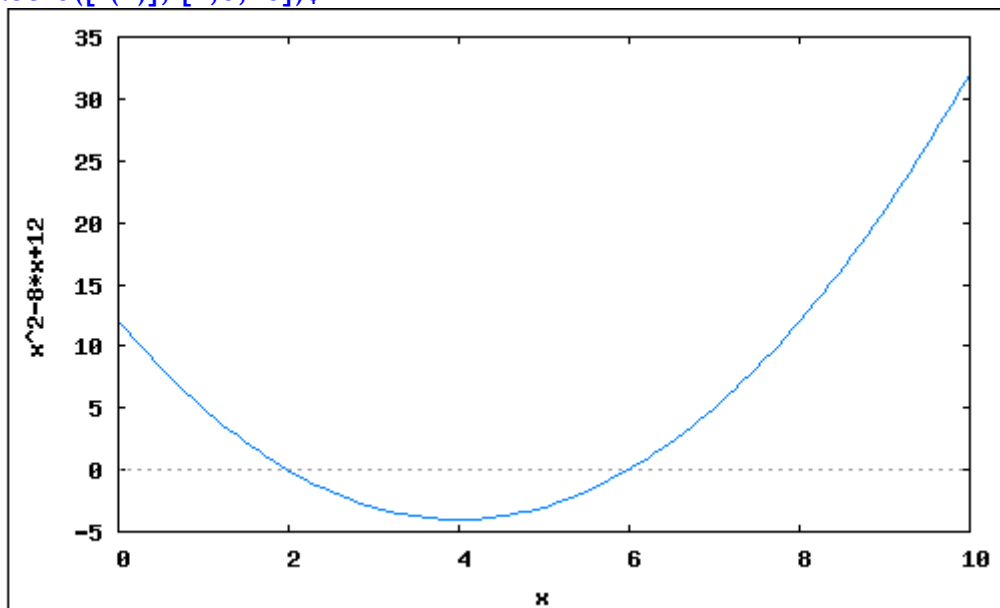
```
(%o5) g(n) := x_{n+1} : x_n - \frac{f(x_n)}{a(x_n)}
```

```
>> Iterationen:makelist(floor(g(n)*1000+0.5)/1000.0,n,0,10);
```

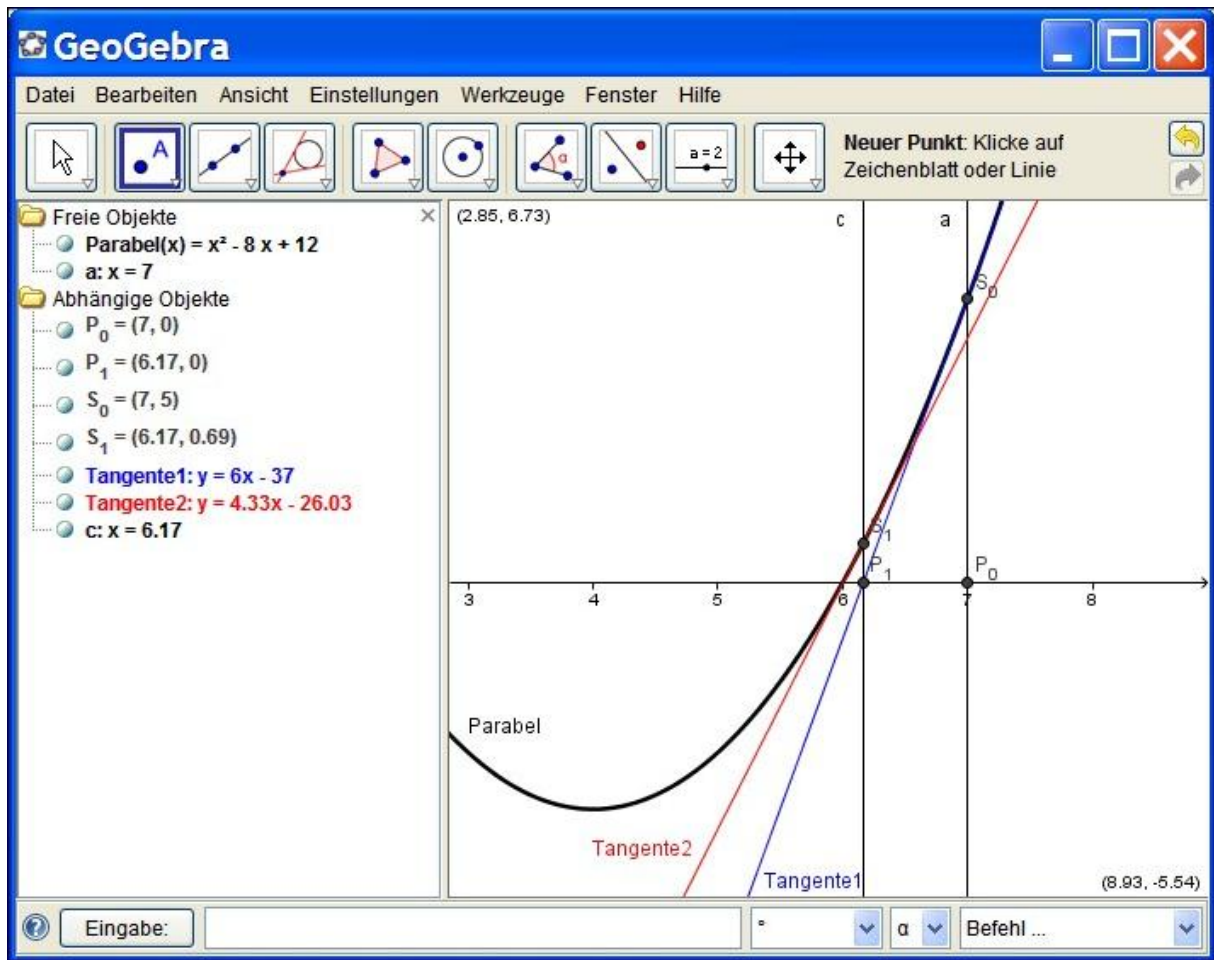
```
(%o9) [ 6.167 , 6.006 , 6.0 , 6.0 , 6.0 , 6.0 , 6.0 , 6.0 , 6.0 , 6.0 ]
```

```
>> wxplot2d([f(x)], [x,0,10])$
```

```
(%t10)
```



Veranschaulichung mit GeoGebra



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