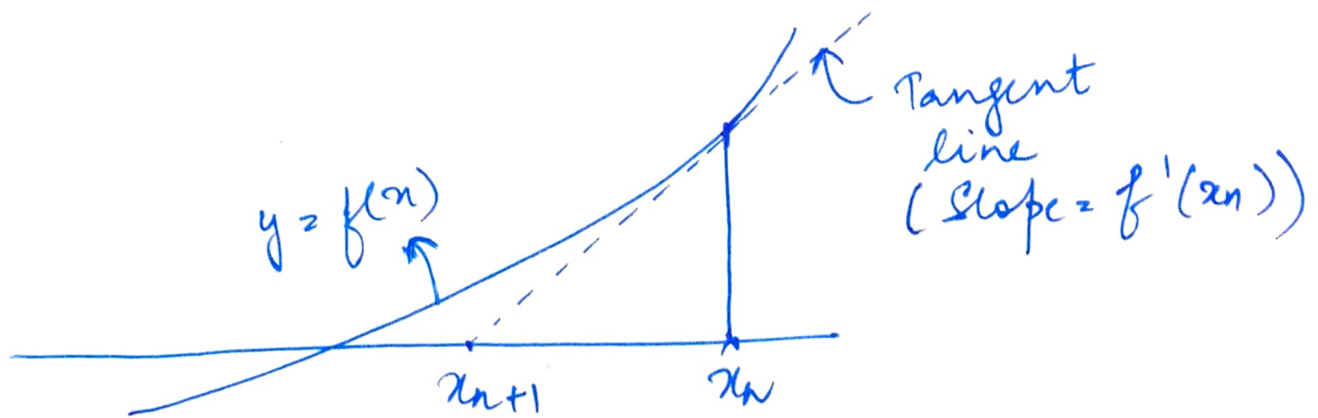


## NEWTON - RAPHSON METHOD

Let  $f(x)$  be a continuous, differentiable func<sup>n</sup>.



Draw a Tangent line to the graph of  $f(x)$  at a chosen point  $(x_0, f(x_0))$

Let the tangent cut the  $x$ -axis at  $x_1$   
 $x_1$  is given by:

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

Draw a Tangent at  $(x_1, f(x_1))$  which meets the  $x$ -axis at  $x_2$

Repeat this procedure till we reach the root of the curve or the desired accuracy.

In general, for any  $x$ -value  $x_n$ ,  
 $x_{n+1}$  (next value) is given by:

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

### ALGORITHM

Read  $x_0$ ,  $\epsilon$ ,  $n$

For  $i = 1$  to  $n$

if  $|df(x_0)| < \epsilon$   
print "Method fails"  
exit

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

if  $|f(x_1)| < \epsilon$   
print " $\{x_1\}$  is the root"  
exit

$$x_0 = x_1$$