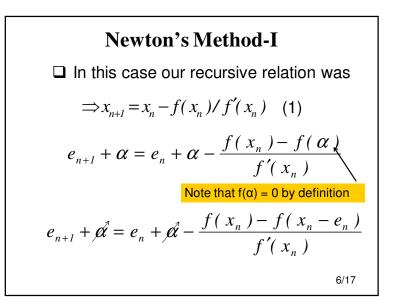
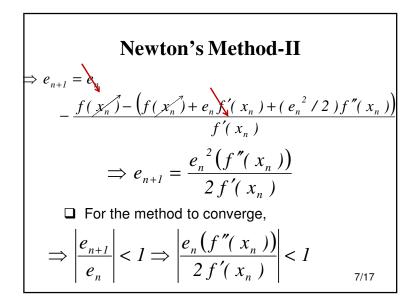
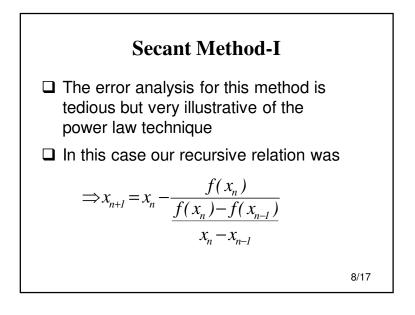
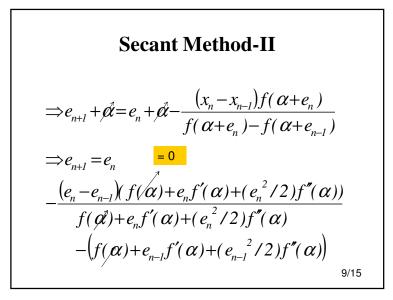


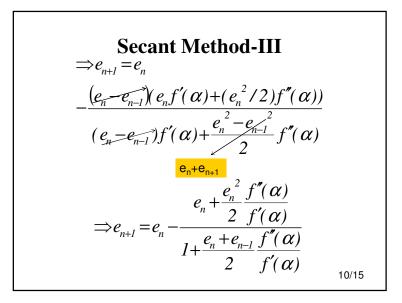
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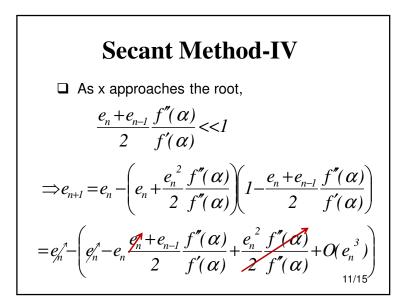




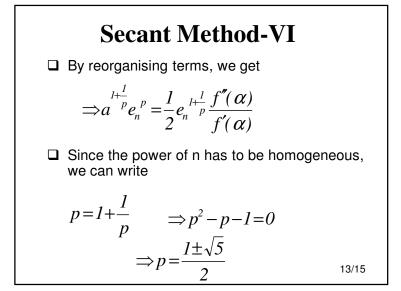








Secant Method-IV
$\Rightarrow e_{n+l} = \frac{e_n e_{n-l}}{2} \frac{f''(\alpha)}{f'(\alpha)} \qquad (1)$
If we assume that the method is of order p, we can write
$e_{n+l} = ae_n^p$ and $e_n = ae_{n-l}^p \Longrightarrow e_{n-l} = \left(\frac{e_n}{a}\right)^{\frac{1}{p}}$
Eq.(1) can now be written as
$\Rightarrow a e_n^{\ p} = \frac{e_n}{2} \left(\frac{e_n}{a}\right)^{\frac{1}{p}} \frac{f''(\alpha)}{f'(\alpha)} $ ^{12/17}



Secant Method-VII

□ If p < 1, the method will diverge. Thus when the method converges, p > 1, which leads to

$$p = \frac{1 + \sqrt{5}}{2} = 1.62$$

Thus the method is inferior to Newton's method, but needs only one function evaluation at a step and hence is competitive

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Continuation Method

- Many times, the equation may be difficult to solve as the root is not known and the function is difficult
- A method called continuation method is very useful
- □ For an arbitrary x_0 , we can say that x_0 is the root of the function $f(x)-f(x_0)$
- □ If we now define our function as $F(x) = f(x) - \beta f(x_0)$, and use x_0 as the guess for β = 0.9, we can find the root because the guess is good
- U We can proceed in this manner successively by reducing β to 0, root of f(x) can be found 15/15