OCT. 21/16

Extra Example:

Use Newton's Method to approximate $\sqrt{2}$ (as a Fraction).

($x = \sqrt{2}$)

Let $f(x) = x^2 - 2 \longrightarrow f'(x) = 2x$

$x_1 = 1$

$x_2 = x_1 - \frac{f(x_1)}{f'(x_1)} \Rightarrow 1 - \frac{f(1)}{f'(1)} \Rightarrow 3/2$

$x_3 = x_2 - \frac{f(x_2)}{f'(x_2)} \Rightarrow \frac{3}{2} - \frac{f(3/2)}{f'(3/2)} \Rightarrow 1\ 5/12$

$x_4 = x_3 - \frac{f(x_3)}{f'(x_3)} \Rightarrow 1\ 5/12 - \frac{f(1\ 5/12)}{f'(1\ 5/12)} \Rightarrow \boxed{1\ \frac{169}{408}}$

$= 1.41421568$

From calc $= 1.414213562\ldots$