

4.2:8 Bruk Newtons metode for å

~~best~~ finne $\sqrt{3}$ ved å løse $x^2 - 3 = 0$

Løsning La $f(x) = x^2 - 3$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}, \quad f'(x) = 2x$$

$$= x_n - \frac{x_n^2 - 3}{2x_n}$$

$$= x_n - \frac{1}{2}x_n - \frac{3}{2} \frac{1}{x_n}$$

$$= \frac{1}{2} \left(x_n + \frac{3}{x_n} \right)$$

$$f(1) = -2 < 0, \quad f(2) = 1 > 0 \Rightarrow r \in (1, 2)$$

$$\text{da } f(2) = 0$$

$$x_0 = ~~1~~ 1.5$$

$$x_1 = 7/4$$

$$x_2 = 97/56$$

$$\boxed{0,5 \left(\text{Ans} + \frac{3}{\text{Ans}} \right)}$$

$$x_3 = 1.73205081$$

$$x_4 = 1.732050808$$

$$x_5 = 1.732050808$$

$$\Rightarrow \underline{\underline{\sqrt{3} = 1.732050808}}$$