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Homework 02

3. $x_0 = 4$, $f(x_0) = 1$, $x_1 = 3$

Sol$^{n}$: According to Newton's Method:

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

We can know:

$$f'(x) = \frac{0 - f(x_n)}{x_{n+1} - x_n}$$

Hence:

$$f'(x_0) = \frac{0 - f(x_0)}{x_1 - x_0} = \frac{0-1}{3-4} = 1$$

$\therefore$ The derivative of $f$ at $x_0$ is 1.