(3) $\begin{cases} x_{i+1} = \mu x_i(1-x_i) \\ x_{i+1} = x_i - \dfrac{f(x_i)}{f'(x_i)} \end{cases}$

$$\mu x_i - \mu x_i^2 = x_i - \frac{f(x_i)}{f'(x_i)}$$

$$\frac{f(x_i)}{\frac{df(x_i)}{dx_i}} = \mu x_i^2 + x_i(1-\mu)$$

$$\frac{f(x_i)}{df(x_i)} = (\mu x_i^2 + x_i(1-\mu))\frac{1}{dx}$$

$$\frac{1}{f(x_i)} df(x_i) = \frac{1}{\mu x_i^2 + x_i(1-\mu)} dx \quad \Big| \int$$

$$\ln|f(x_i)| = \frac{\ln(\mu x_i - \mu + 1) - \ln(x_i)}{\mu - 1} + c_1 \quad \Big| e^x$$

$$|f(x_i)| = c_2 e^{\frac{\ln(\mu x_i - \mu + 1) - \ln(x_i)}{\mu - 1}}$$

When applying Newton's method we are interested in zeros and x-axis intercepts of slopes, neither of which change when taking the absolute value, so we can say

$$f(x_i) = e^{\frac{\ln(\mu x - \mu + 1) - \ln(x_i)}{\mu - 1}}$$