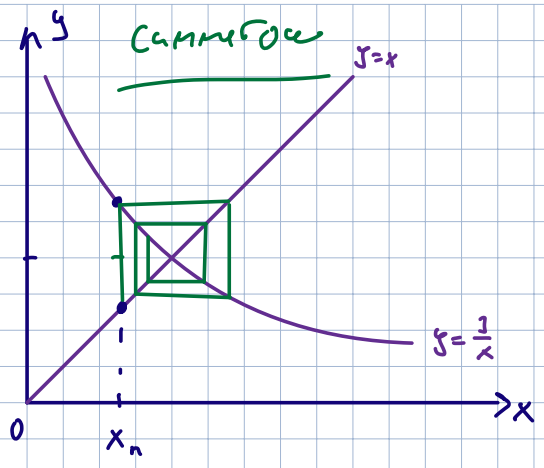
№1

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

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

$2x = x + \frac{3}{x}$

$x = \frac{3}{x} \qquad x = \pm\sqrt{3}$



№2

$x = \frac{1}{2}\left(x + \frac{1}{x_L}\right)$

№4

$a = \frac{1}{3}$

$\left|a - \frac{p}{\varepsilon}\right| \geq \frac{c}{\varepsilon^2}$ $\qquad 3x - 1 = 0$

$3 = 1 \quad , \quad a = \frac{1}{3}$

$\left|\frac{1}{3} - \frac{p}{\varepsilon}\right| \geq \frac{c}{\varepsilon}$

$\left(\frac{1}{3} - \frac{p}{\varepsilon}\right)^2 \geq \left(\frac{c}{\varepsilon}\right)^2$

$\left(\frac{1}{3} - \frac{p}{\varepsilon} - \frac{c}{\varepsilon}\right)\left(\frac{1}{3} - \frac{p}{\varepsilon} + \frac{c}{\varepsilon}\right) \geq 0 \quad \Big| \cdot \varepsilon^2$

$\left(\frac{\varepsilon}{3} - p - c\right)\left(\frac{\varepsilon}{3} - p + c\right) \geq 0$

$\left|\frac{1}{n^2} - L\right| < \varepsilon$

$\frac{1}{n^2} - L < \varepsilon \qquad N^2 + L < N^2 \cdot \varepsilon$

$\frac{|N^2 - L|}{N^2} < \varepsilon$

$|N^2 - L| < N^2 \cdot \varepsilon$

- $\lim\limits_{n\to\infty} \frac{n}{q^n} = ?$

$q > 1$

1) $\lim\limits_{n\to\infty} \frac{n}{q^n}$

$q^n = (1+\varepsilon)^n \le 1 + n\varepsilon + n(n-1)\varepsilon^2$

$$\frac{n}{(q+1)^n} \le \frac{n}{q^n} \le \frac{n}{1 + n\varepsilon + (n^2-n)\varepsilon^2} = \frac{1}{\frac{1}{n} + \varepsilon + (n-1)\varepsilon^2}$$

$$\frac{n}{1 + nq + n(n-1)q^2 \ldots}$$