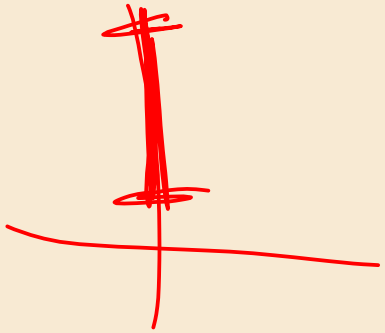
1. Equal

2. Shift

3. Landed



$\lim \frac{0}{0}$

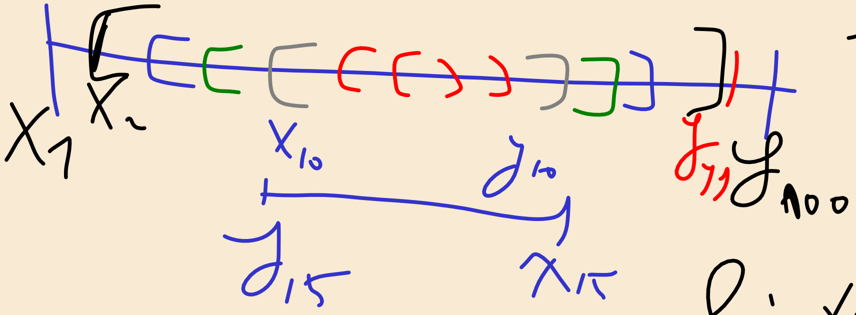
$\frac{\infty}{\infty}$

1. $x_n \nearrow$ $\quad x_3 \not> x_2$

$y_n \searrow$

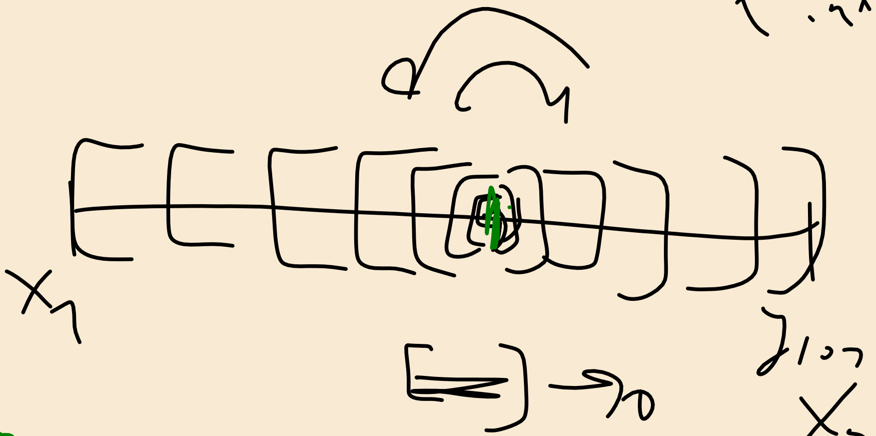
2. $x_n < y_n$

3. $y_n - x_n \to 0$



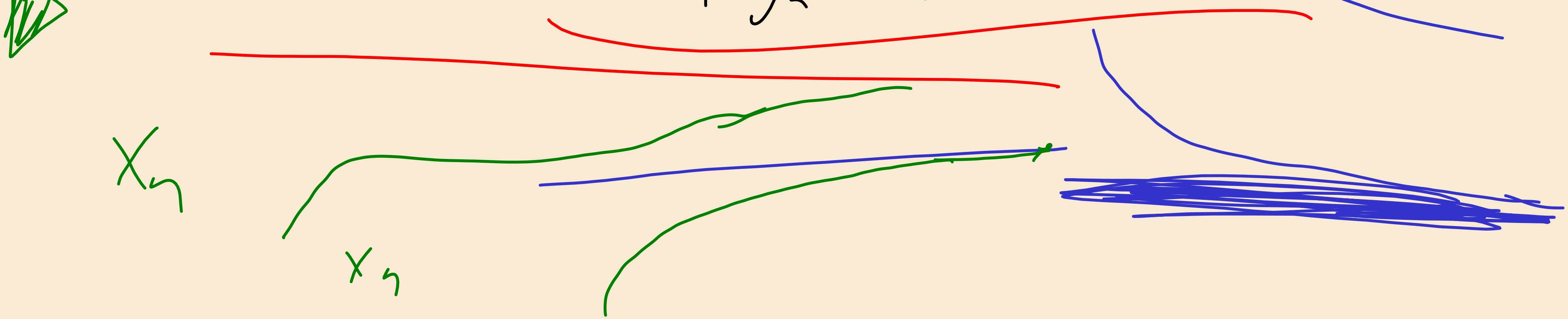
1. x_{n_1}, y_1 ∃

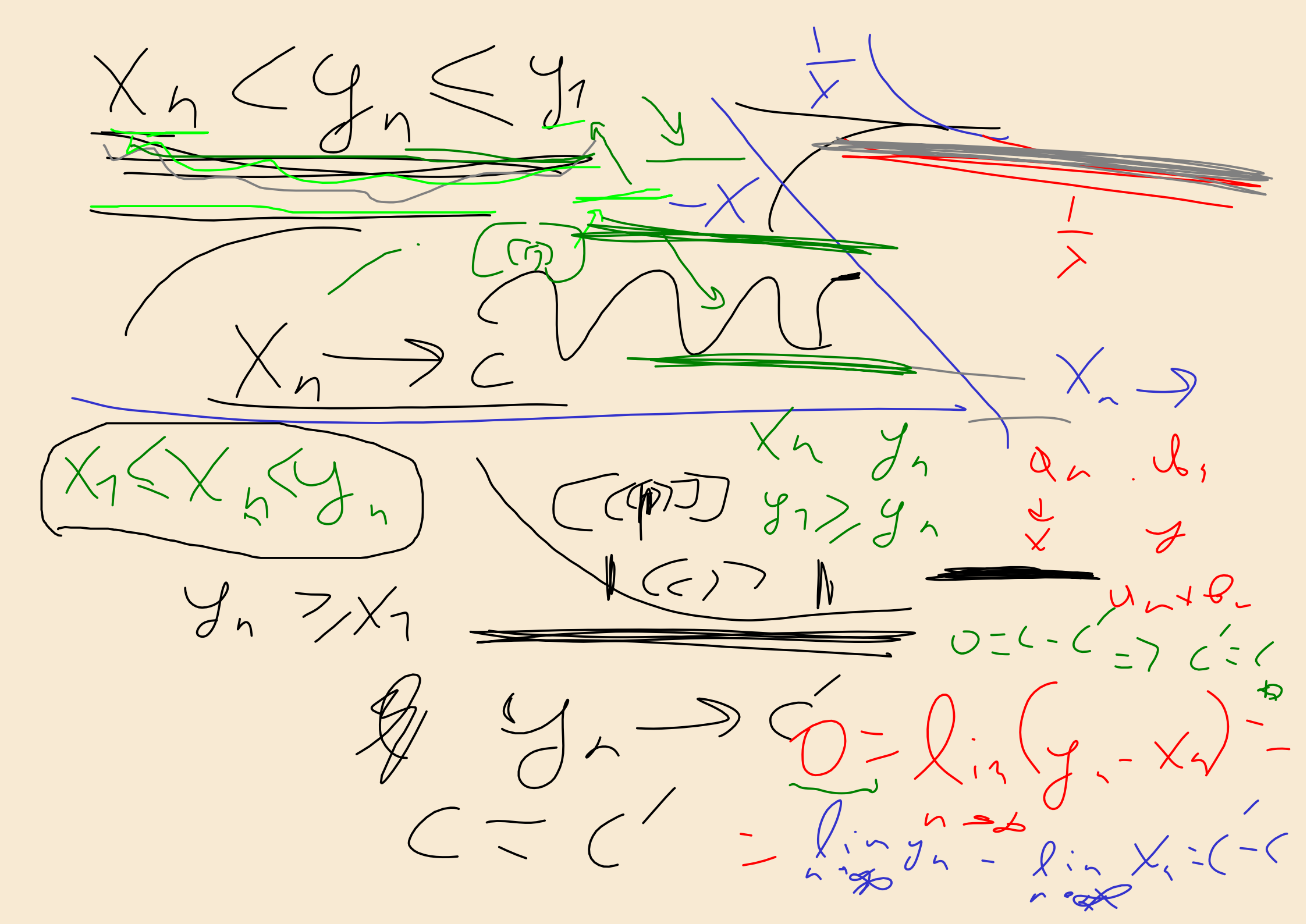
$\ell : x_n, y_n$



$x_n < y_n$

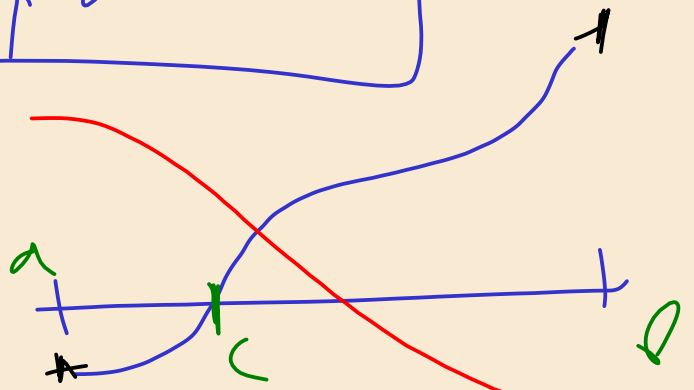
$\frac{1}{x} \to 0$ $\quad 0 > 0$




$x_n < y_n \leq y_1$
$x_n \to c$
$x_1 \leq x_n < y_n$
$y_n \geq x_1$
$x_n \; y_n$
$y_1 \geq y_n$
$a_n \cdot b_n$
y
$u_n + v_n$
$0 = c - c \Rightarrow c = c$
$y_n \to c'$
$c = c'$
$0 = \lim (y_n - x_n) =$
$= \lim_{n \to \infty} y_n - \lim_{n \to \infty} x_n = c - c$

int. val. thm.

f $C[a,b]$



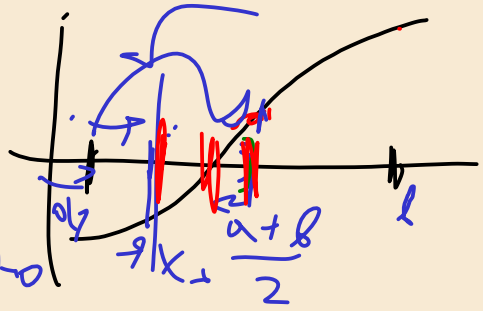
$f'(x) < 0$

$f'(b) > 0$

$f'(c) = 0$

$f(a) < 0$

$f(b) > 0$



$[a_1, b_1]$ $[a_n, b_n]$

$[a, b]$ ϑ_n ... $f(x_0) > 0$

$f(x_0) = 0$ $f(x_0) < 0$

$a_n < b_n$

$a_n \nearrow$; $b_n \searrow$

$b_n - a_n \to 0$

$\lim$ $\leq$ $<$ $=$

$\lim a_n = \lim b_n$

a_1, x_0 x_0, b

$b_n - a_n = \frac{b-a}{2^n} \to 0$

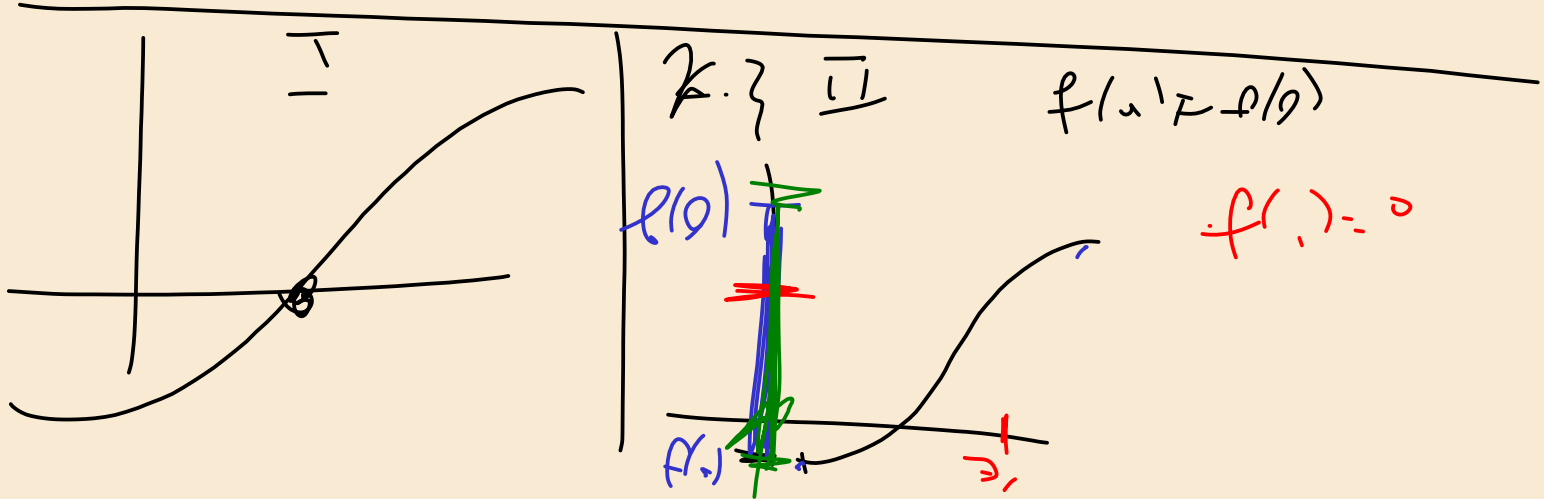
$b_2 - a_2 = \frac{b-a}{2^2}$

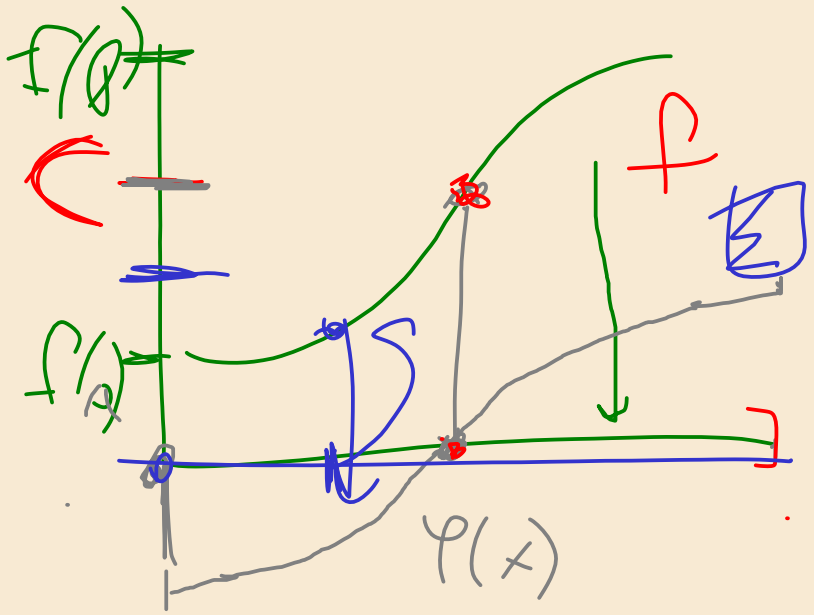
$f(a) = 0$

$a_n \to 0$

$a_n < 0$

$b_n > 0$





$f(a) < C < f(b)$

$\varphi(x) = f(x) - C$

$\varphi(x)$

$f(x) = \varphi(1+c)$

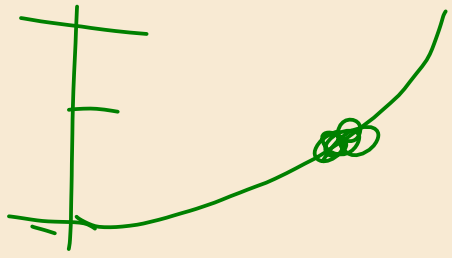
$0 < c$

$x^3 + x - 1 = 0$

$[0,1]$

$f(0) = 0 + 0 - 1 = -1$

$f(1) = 1 + 1 - 1 = 1$



$$\lim_{x \to a} \frac{f(x)}{g(x)}$$

$f(x) \to 1$

$g(x) \to \infty$

$y(x) \to \frac{1}{\infty} = 0$

$\frac{0}{0}$ $\quad$ $\frac{\infty}{\infty}$

$\frac{-\infty}{\infty} \to 0$ $\quad$ $\frac{0}{0}$

$x \to \infty^-$

$\frac{\infty}{\infty}$

$\frac{x}{x^2} = \frac{1}{x} \to 0$

$\frac{x^2}{x} \quad \frac{2x}{2}$

$2x \to \infty$

$x \to -\infty \quad \frac{\infty}{-\infty} \quad \frac{x^2}{x} = x \to \infty$

$$\lim_{x \to 1} \frac{f(x)}{g(x)} = \lim_{x \to 1} \frac{f'(x)}{g'(x)}$$

$\frac{x}{x^1}$

$\frac{1}{2x} \to \frac{1}{\infty} \to 0$

$$\frac{x^2-4}{x-2} \xrightarrow[x\to 2]{\frac{0}{0}} \frac{2x}{1} \xrightarrow[x\to 2]{} 4$$

$$\frac{(x-2)(x+2)}{(x-2)} \quad x\neq 2$$

$$x+2 \quad \frac{0}{0}$$

$$\lim_{x\to\infty} \frac{3x+1}{2x-5} \to \frac{\infty}{\infty}$$

$$\frac{3}{2} = 1.5$$

$\lim_{x \to 0} \frac{1-\cos x}{x^2}$ $\frac{0}{0}$

$\frac{0}{0} \overset{?}{=} 3$

$\lim_{x \to 0} \frac{\sin x}{x}$ $\frac{0}{0}$

$2x$

$2x \quad x \to 0$

$x = 0$

$x^2 \xrightarrow[x \to 0]{} 0^2$

$\frac{1}{x^2} + \frac{3x}{x^5} \quad \frac{\infty}{\infty}$

$1 - \cos x \xrightarrow[x \to 0]{}$

$9^2 \quad 0.5^2 \quad 01^2$

$0 \to 1^2 \Rightarrow$

$\frac{\cos x}{2} \xrightarrow[x \to 0]{} \frac{1}{2}$

$1 - \cos 0 = 1 - 1 = 0$

$\ln(1+x)^x$

$$\lim_{x \to 0} \frac{\ln(1+x)}{x}$$

$0 \to \frac{1}{1+x}$

$f(y(x))'$

$\ln(1+0) = \ln(1)$

$e^{\ln(1)} = 1$

$(x+1)'$

$(\ln x)' = \frac{1}{x}$

$\ln(x+1) = (x+1)'$

$x+1 = x$

$f(x) = x$

$\ln x + x \quad \frac{1}{x+1}$