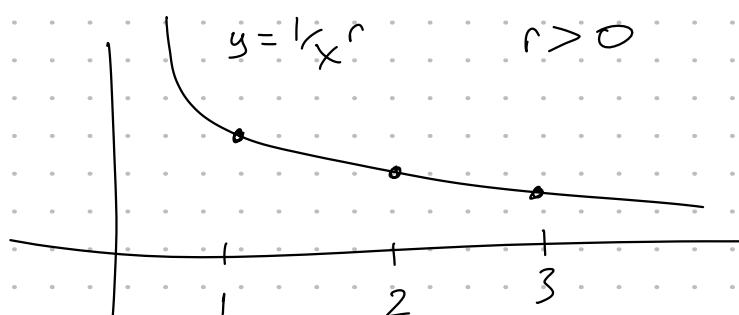


$$\lim_{n \rightarrow \infty} a_n$$



Example $a_n = \frac{1}{n^r} \quad r > 0$

$$\lim_{n \rightarrow \infty} a_n = \lim_{x \rightarrow \infty} f(x) = 0$$

$$a_n = \frac{1}{n^r} = f(n) \quad \text{where } f(x) = \frac{1}{x^r}$$

$$\lim_{x \rightarrow \infty} f(x) = \lim_{x \rightarrow \infty} \frac{1}{x^r} = 0$$

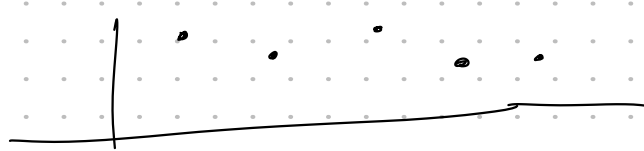
Example $\lim_{n \rightarrow \infty} \frac{n}{n+1} = \lim_{n \rightarrow \infty} \frac{\frac{1}{n}}{\frac{1}{n}(n+1)} = \lim_{n \rightarrow \infty} \frac{1}{1 + \frac{1}{n}} = \frac{1}{1+0} = 1$

Example Is $a_n = \frac{n}{\sqrt{10+n}}$ CONV or DIV?

$$a_n = \frac{n}{\sqrt{10+n}} = \frac{1}{\frac{\sqrt{10+n}}{n}} = \frac{1}{\sqrt{\frac{1}{n^2}(10+n)}}$$

$$= \frac{1}{\sqrt{\frac{10}{n^2} + \frac{1}{n}}} \rightarrow 0 \quad \rightarrow +\infty \quad \text{DIV}$$

Example Find $\lim_{n \rightarrow \infty} \frac{\ln n}{n}$



Consider $f(x) = \frac{\ln x}{x}$ $\lim_{x \rightarrow \infty} \frac{\ln x}{x} \stackrel{L'H}{=} \lim_{x \rightarrow \infty} \frac{\frac{1}{x}}{1} = 0$

$$a_n = \frac{\ln n}{n} = f(n) \quad a_n \rightarrow 0 \text{ as } n \rightarrow \infty \text{ as well.}$$

WW8 Q13 is a file of its own, now.

Also I made a separate video for that.