

Show that function $f(x) = \frac{1}{x} + \sqrt{x+1}$ is continuous at $x=1$.

Theorem 2.4.1

①

$$\left[\frac{1}{x} \right]$$

$$\left[\sqrt{x+1} \right]$$

These rational and root
functions are continuous
everywhere on their
domains

→ If they are
continuous everywhere
on their domains,
then they are
continuous at $x=1$.

Theorem 2.4.2

② $g(x) = \frac{1}{x}$, $h(x) = \sqrt{x+1}$

↓

$$f(x) = g(x) + h(x), \text{ } f \text{ is continuous at } x=1$$

→ This is an addition operation
so f is continuous at $x=1$.

You can also use the definitions of continuity and
limit laws to prove it.