

Quiz

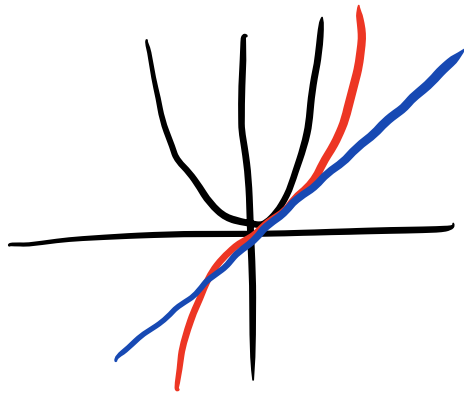
$$\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} \left(\frac{\sqrt{x+1} + 2}{\sqrt{x+1} + 2} \right) = \lim_{x \rightarrow 3} \frac{(x+1) - 4}{(x-3)(\sqrt{x+1} + 2)}$$

$$= \lim_{x \rightarrow 3} \frac{\cancel{(x-3)}}{\cancel{(x-3)}(\sqrt{x+1} + 2)} = \lim_{x \rightarrow 3} \frac{1}{\sqrt{x+1} + 2} = \frac{1}{\sqrt{3+1} + 2} = \frac{1}{\sqrt{4} + 2}$$

$$= \frac{1}{2+2} = \frac{1}{4}$$

$$\lim_{x \rightarrow 0} x^3 \sin\left(\frac{1}{x^2}\right)$$

$$|x^3| \left(-1 \leq \sin\left(\frac{1}{x^2}\right) \leq 1 \right)$$



$$-|x^3| \leq x^3 \sin\left(\frac{1}{x^2}\right) \leq |x^3|$$

↓
0

$$\lim_{x \rightarrow 0} x^3 \sin\left(\frac{1}{x^2}\right) = 0$$

Homework 4

$$b) f(x) = \frac{x^2 - 9x + 20}{x^2 - 3x + 2} = \frac{(x-4)(x-5)}{(x-2)(x-1)}$$

vertical asymptote: $x=2, x=1$

holes: no

horizontal asymptotes: $y=1$

Homework 5

b) VAVE from 4 to $4+h$

$$s(4) = -124$$

$$\begin{aligned} \text{VAVE} &= \frac{s(4+h) - s(4)}{4+h-4} \\ &= \frac{-10(4+h)^2 + 8(4+h) + 4 + 124}{h} \\ &= \frac{-10(4+h)^2 + 8(4+h) + 128}{h} \end{aligned}$$

$$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

↑

or

$$\lim_{x \rightarrow a} \frac{f(x) - f(a)}{x-a}$$

↑