

**Q1 Quiz 1**

10 Points

No files uploaded

**Show your work and explain your claim**

$$\text{Let } f(x) = \begin{cases} -7, & \text{if } x \leq 0 \\ \frac{x^2 - 7x}{x}, & \text{if } 0 < x < 2. \\ 2, & \text{if } x \geq 2 \end{cases}$$

Is  $f$  a continuous function?

Let's check the continuity of  $f$  at  $x=2$

$$\lim_{x \rightarrow 2^+} f(x) = \lim_{x \rightarrow 2^+} 2 = 2$$

$$\lim_{x \rightarrow 2^-} f(x) = \lim_{x \rightarrow 2^-} \frac{x^2 - 7x}{x} = \lim_{x \rightarrow 2^-} \frac{x(x-7)}{x} = -5$$

$$\text{As } \lim_{x \rightarrow 2^-} f(x) \neq \lim_{x \rightarrow 2^+} f(x), \quad \lim_{x \rightarrow 2} f(x)$$

does not exist. As even the limit of  $f$  at  $x=2$  does not exist,  $f$  cannot be a continuous func.

⚠  $f$  is cont everywhere away from  $x=2$ . (Exc.)