

# MAC2311 Class Number 15498

## QUIZ 1

1/17/2019

Name: SOLUTIONS

1. Find the limit:

$$\lim_{x \rightarrow 2^-} \frac{x+2}{x^2-4}$$

1. SIMPLIFY:  $\lim_{x \rightarrow 2^-} \frac{x+2}{(x+2)(x-2)} = \lim_{x \rightarrow 2^-} \frac{1}{x-2} = \frac{1}{2-2} = \frac{1}{0}$  "NUMBER"

2. PICK A NUMBER CLOSE TO 2, TO THE LEFT OF 2, SAY  $x = 1.9$

$$\Rightarrow \frac{1}{x-2} = \frac{1}{1.9-2} = \frac{\text{POSITIVE \#}}{\text{NEGATIVE \#}} = \text{NEGATIVE \#}$$

2. Find the limit:

$$\lim_{x \rightarrow 3} \frac{x-3}{x^2-2x-3}$$

1. SIMPLIFY:  $\lim_{x \rightarrow 3} \frac{(x-3)}{(x-3)(x+1)} = \lim_{x \rightarrow 3} \frac{1}{x+1} = \frac{1}{3+1} = \boxed{\frac{1}{4}}$

$$\Rightarrow \boxed{-\infty}$$

3. Find the limit:

$$\lim_{x \rightarrow 4} \frac{-2x+8}{|x-4|} = \lim_{x \rightarrow 4} \frac{-2(x-4)}{|x-4|}$$

1.  $\lim_{x \rightarrow 4^+} \frac{-2x+8}{|x-4|}$  : SINCE  $x \rightarrow 4^+$ ,  $x > 4 \Rightarrow |x-4| = x-4$ , so  $\lim_{x \rightarrow 4^+} \frac{-2(x-4)}{(x-4)} = -2$

2.  $\lim_{x \rightarrow 4^-} \frac{-2(x-4)}{|x-4|}$  : SINCE  $x \rightarrow 4^-$ ,  $x < 4 \Rightarrow |x-4| = -(x-4)$ , so

$$\lim_{x \rightarrow 4^-} \frac{+2(x-4)}{+(x-4)} = 2$$

SINCE  $\lim_{x \rightarrow 4^+} \frac{-2x+8}{|x-4|} \neq \lim_{x \rightarrow 4^-} \frac{-2x+8}{|x-4|}$  1,  $\lim_{x \rightarrow 4} \frac{-2x+8}{|x-4|} = \boxed{\text{DNE}}$