MAC2311 Class Number 15534
QUIZ 2
1/24/2019

Name: SOLUTIONS

1. Find the limit:

$$\lim_{x\to 0} \frac{x^2+2x-8}{x^2+x-4} = \frac{0+2(0)-8}{0+0-4}$$

$$= \frac{-8}{-4} = \boxed{2}$$

2. Let $f(x) = \dfrac{x^2+x-6}{x^2-x-2}$. How would you define $f(2)$ in order to make f continuous at 2?

$$f(x) = \frac{(x+3)\cancel{(x-2)}}{(x+1)\cancel{(x-2)}} = \frac{x+3}{x+1}$$: FIND $f(2)$ FOR $f(x) = \dfrac{x+3}{x+1}$

$$f(2) = \frac{2+3}{2+1} = \frac{5}{3}$$

$$\boxed{f(2) = \frac{5}{3}}$$

3. Let

$$f(x) = \begin{cases} (x-3)^2 - 10 & -\infty < x \le -2 \\ x+6 & -2 < x \le -1 \\ x^2 - 3x + 1 & -1 < x < \infty \end{cases}$$

Find the numbers at which f is discontinuous. At which of these points of discontinuity is f continuous from the right? At which of these points of discontinuity is f continuous from the left? *LOOK @ "CHANGE" POINTS, $X=-2$, $X=-1$

1. $\lim_{x\to -2^-} f(x) = (-2-3)^2 - 10 = (-5)^2 - 10 = 15$

$\lim_{x\to 2^+} f(x) = (-2+6) = 4$

SINCE $\lim_{x\to -2^-} f(x) \neq \lim_{x\to -2^+} f(x)$, f IS DISCONTINUOUS AT $X=-2$. SINCE f IS DEFINED AT $X=-2$ FROM THE LEFT, f IS CONTINUOUS AT $X=-2$ FROM THE LEFT. f IS NOT CONTINUOUS AT $X=-2$ FROM THE RIGHT.

2. $\lim_{x\to -1^-} f(x) = -1 + 6 = 5$

$\lim_{x\to -1^+} f(x) = (-1)^2 - 3(-1) + 1$

$= 1 + 3 + 1 = 5$