Math 131 - Quiz 2

September 1, 2021

Name key

Score _____

Evaluate each limit analytically. Show all work to receive full credit. Supply explanations when necessary. Each problem is worth 2 points. This quiz is due September 8.

1. $\lim_{x\to 0} \dfrac{x^2+5x+6}{x^2-9} = \dfrac{6}{-9} = -\dfrac{2}{3}$ DIRECT SUBSTITUTION

0/0 MORE WORK

2. $\lim_{x\to 10} \dfrac{x-10}{\sqrt{x-1}-3}$

$$\lim_{x\to 10} \frac{x-10}{\sqrt{x-1}-3} \cdot \frac{\sqrt{x-1}+3}{\sqrt{x-1}+3} = \lim_{x\to 10} \frac{(x-10)(\sqrt{x-1}+3)}{x-1-9} = \lim_{x\to 10} (\sqrt{x-1}+3) = 6$$

$\frac{1}{0} - \frac{7}{0}$ MORE WORK

3. $\lim_{x\to 5} \left(\dfrac{1}{x-5} - \dfrac{7}{x^2-3x-10}\right)$

$$\lim_{x\to 5} \frac{1}{x-5} - \frac{7}{(x-5)(x+2)} = \lim_{x\to 5} \frac{x+2-7}{(x-5)(x+2)} = \lim_{x\to 5} \frac{x-5}{(x-5)(x+2)} = \frac{1}{7}$$

0/0 MORE WORK

4. $\lim_{x\to 1^+} \dfrac{x^2-1}{x-1}$

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

5. $\lim_{x\to 1^-} f(x)$ where $f(x) = \begin{cases} \cos \pi x, & x < 1 \\ x^2 - 1, & x > 1 \end{cases}$

$$\lim_{x\to 1^-} f(x) = \lim_{x\to 1^-} \cos \pi x = \cos \pi = -1$$