

Name: _____ I.D.#: _____ Serial #: _____

Section #

14

20

Answer all the questions

Show all of your work

Question #	1	2	3	4	5	6	7	8	Total /40
Grade	/5	/5	/5	/5	/5	/5	/5	/5	

1. Use basic definition to find $f'(2)$, if $f(x) = 1 - 2x^2$

2. Use basic definition to find δ , if $f(x) = \frac{1}{x-1}$

3. Given $\epsilon > 0$, find a suitable $\delta > 0$, to show $\lim_{x \rightarrow 2} (9 - 2x) = 5$

4. $\lim_{x \rightarrow \infty} \frac{e^x}{e^{-x} e^x}$

5. Let $f(x) = \begin{cases} \frac{\sin(x-2)}{x^2-4} & \text{if } x \neq 2 \\ k & \text{if } x = 2 \end{cases}$

6. Let $f(x) = \begin{cases} x \cos \frac{1}{x} & \text{if } x \neq 0 \\ 0 & \text{if } x = 0 \end{cases}$, show that $f(x)$ is continuous, but it is not differentiable at $x = 0$

7. To show that $\lim_{x \rightarrow \infty} \frac{4x}{2x-1} = 2$, let $\epsilon = 0.00001$, then find a suitable $M > 0$, so that if $x > M$, then $\left| \frac{4x}{2x-1} - 2 \right|$

8. For each of the following give a short answer in the assigned space:

a. $\lim_{x \rightarrow 0} \frac{\sin 2x}{x}$

b. $\lim_{x \rightarrow 1} 3x - 2$

c. $\lim_{x \rightarrow 1} \ln 3x$

d. $\lim_{x \rightarrow 1} \frac{2x^2 - 3x + 7}{7x^2 - x + 1}$

e. The domain of continuity of $f(x) = \frac{e^{\frac{1}{x}}}{1-x}$ is equal to
