Calculus I	Name:
Study Guide 6	Class:
Due Date:	Score:

No Work $\Leftrightarrow$ No Points

Use Pencil Only $\Leftrightarrow$ Be Neat & Organized

1. (4 points) Find a value for the constant k that will make the following function continuous.

$$f(x) = \begin{cases} kx^2, & x \le 2 \\ 2x + k, & x > 2 \end{cases}$$

1. _____

2. (4 points) Find a value for the constant k that will make the following function continuous.

$$f(x) = \begin{cases} \dfrac{x^2 - 4}{x^3 - 8}, & x \ne 2 \\ k, & x = 2 \end{cases}$$

2. _____

3. (4 points) Prove if $f(x)$ is continuous and nonnegative, then find $\sqrt{f(x)}$ is continuous.

3. _____

4. (4 points) Evaluate: $\displaystyle\lim_{x \to a} \frac{x^6 - a^6}{x^2 - a^2}$

4. _____

5. (4 points) Evaluate: $\displaystyle\lim_{x \to 0} \frac{\sin 7x}{\sin 3x}$

5. _____

6. (4 points) Evaluate: $\displaystyle\lim_{x \to 3} \frac{\sin(x - 3)}{x^2 + 2x - 15}$

6. _____

7. (4 points) Evaluate $\lim\limits_{h\to 0} \dfrac{f(x+h) - f(x)}{h}$ for $f(x) = \dfrac{1}{x-1}$.

7. _____

8. (4 points) Find the equation of the tangent line to the graph of $f(x) = x^3$ at the point $(1, 1)$.

8. _____

9. (4 points) Evaluate: $\lim\limits_{x\to\pi/2} \dfrac{1 - \cos(x - \pi/2)}{x - \pi/2}$

9. _____

10. (5 points) Find the equation of the normal line to the graph of $f(x) = \sqrt{x}$ at the point $(4, 2)$.

10. _____

11. (4 points) Evaluate $\lim\limits_{x \to 0} f(x)$ if $1 - x^4 \leq f(x) \leq \cos x$ for all x in $[-\pi/2, \pi/2]$.

11. _____

12. (5 points) For $\epsilon = 0.1$, find $0 < \delta \leq 1$ such that $\lim\limits_{x \to 3} x^2 = 9$.

12. _____