Calculus I	**Name:** _____
Study Guide 7	**Class:** _____
Due Date: _____	**Score:** _____

No Work ⇔ No Points

Use Pencil Only ⇔ Be Neat & Organized

---

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

$$f(x) = \begin{cases} kx^2, & x \leq 2 \\ kx + 8, & x > 2 \end{cases}$$

1. _____

---

2. (4 points) Evaluate: $\lim_{x \to a} \dfrac{x^2 + ax - 2a^2}{x^3 - a^3}$, express any restriction for your final answer.

2. _____

---

3. (4 points) Evaluate: $\lim_{x \to -1} \dfrac{1 - \cos(x^2 - 1)}{x^2 - 1}$

3. _____

---

4. (4 points) Evaluate: $\lim_{x \to 2} \dfrac{x^{-1} - 2^{-1}}{x - 2}$

4. _____

---

5. (4 points) Evaluate: $\lim_{x \to -2} \dfrac{x^2 - 4}{|x| - 2}$

5. _____

---

6. (4 points) Evaluate: $\lim_{x \to 16} \dfrac{x - 16}{\sqrt{x} - 4}$

6. _____

---

7. (5 points) Evaluate $\lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$ for $f(x) = \cos x$.

7. _____

8. (3 points) Show that the equation $x^3 + x^2 - 2x = 1$ has at least one solution on the interval $[-1, 1]$.

8. _____

9. Given $\lim_{x\to a} f(x) = b$, find $\lim_{x\to a} f(-x)$

(a) (2 points) if $f(x)$ is an even function.

(a) _____

(b) (2 points) if $f(x)$ is an odd function.

(b) _____

10. (4 points) Show that the equation $2\sin x + 1 = x$ has at least one solution on the interval $[-1, 3]$.

10. _____

11. (5 points) Evaluate $\lim_{x \to 0} \dfrac{\sqrt{4x+1} - \sqrt{3x+1}}{x}$.

11. _____

12. (5 points) Evaluate $\lim_{x \to 6} \dfrac{\dfrac{1}{x+4} - \dfrac{1}{10}}{x^2 - 36}$.

12. _____