<table>
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<th>score</th>
<th>possible</th>
<th>problem</th>
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<td>Work in groups of 3 or 4. Show your work. Acknowledge any help on these specific problems.</td>
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\[
1. \text{ Consider the function } f(x) = \begin{cases} 
  x^2 - 1 & \text{if } x \leq -2 \\
  x + A & \text{if } x > -2 
\end{cases},
\]

where \( A \) is some constant.

(a) Find \( \lim_{x \to -2^-} f(x) \). Is \( f \) continuous from the left at \( x = -2 \)?

(b) What value of \( A \) would make \( f \) continuous at \( x = -2 \)?

(c) Using the value of \( A \) that you just found, graph \( f \).
2. State the Squeeze Theorem. Identify what are its assumptions (hypotheses) and what are its conclusions. Use the Squeeze Theorem to evaluate \( \lim_{x \to 0} \sin(x) \cos\left(\frac{1}{x^2}\right) \). Indicate which functions you are using to squeeze.

3. State the Intermediate Value Theorem. Identify what are its assumptions (hypotheses) and what are its conclusions. Use the Intermediate Value Theorem to show that the equation \( 3^x = x^2 \) has a solution.
4. Sketch the graph of a single function $f$ that:
   - has domain $[-4, 5]$
   - has $f(2) = 1$
   - has $\lim_{x \to 2} f(x) = 4$
   - has $\lim_{x \to 3^+} f(x) = -3$
   - has $\lim_{x \to 3^-} f(x) = 3$
   - is continuous except possibly at $x = 1$, $x = 2$, and $x = 3$
5. Sketch the graph of a single function $f$ that:

- has $\lim_{x \to 2} f(x) = \infty$
- has $\lim_{x \to -2^+} f(x) = \infty$
- has $\lim_{x \to -2^-} f(x) = -\infty$
- has $\lim_{x \to -\infty} f(x) = \infty$
- has $\lim_{x \to \infty} f(x) = \infty$
- is continuous except possibly at $x = 2$ and $x = -2$